

YASKAWA

BESTACT SOLUTIONS INC.

Bestact

Yaskawa Power Reed Switch

Bestact, with its outstanding environmental immunity and durability, truly is the "best contact".



BESTACT SOLUTIONS INC.

<https://bestact.co.jp>



ISO9001
JQA-QMA15922

Yaskawa Power Reed Switch Bestact Provides High Reliability and High Levels of Safety to Your Systems. Additionally Realize Easy Maintenance and Minimization of Your Systems.

Bestact

Yaskawa Power Reed Switch



Yaskawa Power Reed Switch Bestact is used as an interface element for ultra-high reliability control systems and has the high levels of safety applicable in control systems.

Due to its outstanding environmental immunity, durability, and maintainability, Bestact truly is the "best contact". As a characteristic, it has the ability of controlling the opening and closing of DC inductive loads.

Large- and medium-capacity types are available depending on the application and operating conditions. I/O Relays, Multipole Relays, Limit Switches, Magnetic Proximity Switches, and Selector Switches are available as products incorporating Bestact. According to customer demands, we also produce units meeting various intended purposes.

Yaskawa has expanded the line-up of Bestact and products incorporating Bestact that achieve total cost reduction in equipment and installation, and we plan to keep developing and designing new uses and features to meet the needs of our customers.

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Bestact improves reliability for various systems and equipment, and provides help for VA

Features of Bestact Products

Vibration and Impact (Shock) Resistance

For large capacity types the vibration resistance is 196m/s^2 {20G} and the impact resistance is 392m/s^2 {40G}. The movable contact is small compared with conventional reed switches, and a leaf spring armature holds it (through the use of a specially designed backstop mechanism) against the glass tube wall making it especially strong against vibration and impact, even when not energized.

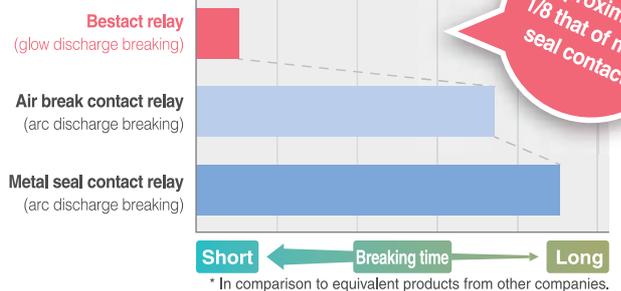
Outstanding operational characteristics under the most punishing environmental conditions

Because Bestact is a hermetically sealed contact in a glass tube, it remains entirely unaffected by external factors such as gas, humidity, water, oil, dust, high/low temperatures, high inrush current, voltage surge and noise.

Suitable for opening/closing of direct current loads

When general air break contacts and metal seals break direct current lead loads, they use arc discharge to break. In particular, with air break contacts there is a high tendency of contact wear caused by arc discharges. On the other hand, Bestact has a longer service life because the breaking current density is low due to the use of glow discharge when breaking, which results in even wear for the contact surface. Because Bestact uses sealed contacts it does not require maintenance such as polishing the contact surface of contacts.

Comparison of breaking times (ms) (from our own research)



Universal Control Load Applicability

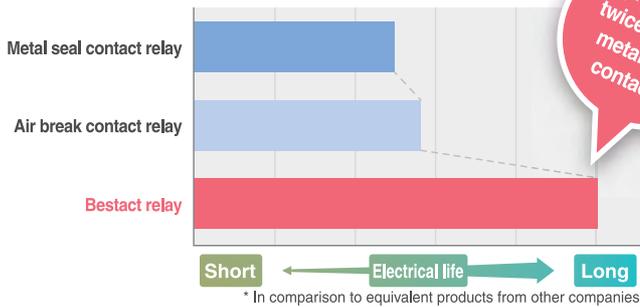
Allows Standardization around One Contact for All Your Switching Needs

Permits direct opening and closing from 24V 1mA using both AC and DC to DC 110V 0.5A (inductive loads such as solenoid valves and contactors). Being able to be used on a wide range of applications such as from CPU input circuits to output contacts makes Bestact a very versatile solution.

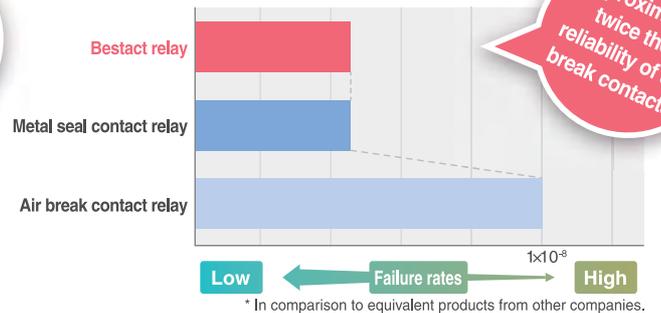
Long Service Life and Low Failure Rate

Compared to products from other companies, Bestact has a low failure rate and has approximately twice the electrical life.

Electrical life comparison (tens of thousands of times) (from our own research)



Failure rate comparison with minute loads (from our own research)



High "Reliability", "Safety" and "Quality"

Bestact's high "Reliability", "Safety" and "Quality" has been confirmed by third party organizations. By correctly using Bestact, high "Reliability", "Safety" and "Quality" can be achieved.



Certified functional safety standard SIL3 capable (HFT=1): "Reliability" and "Safety" tested



Certified reed switch standard IEC62246: "Quality" tested

Various industries that Bestact is used in



○ EMC

The main types of Bestact products fulfill the requirements of the EMC test stipulated by the IEC 61000-4-4 to 4-6 standards.

○ Disaster preventing capacity

The main types of Bestact products fulfill the requirements of the disaster preventing capacity test stipulated by the EN 45545-2 standard.

Standard citations

The "*" mark indicates compliance standards and no mark indicates reference standards.

Standard	International standards (including the EN, UL, and GB standards)
Functional safety	GB/T 20438.1 – 2006* (IEC 61508-1:1998), Functional safety of electrical /electronic/programmable electronic safety-related systems
	GB/T 20438.2 – 2006* (IEC 61508-2:2000), Functional safety of electrical /electronic/programmable electronic safety-related systems
	GB/T 28526 – 2012* (IEC 62061:2005), Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems
	GB/T 16855.1 – 2008* (ISO 13849-1:2006), Safety of machinery -- Safety-related parts of control systems -- Part 1: General principles for design
	GB/T 16855.2 – 2007* (ISO 13849-2:2003), Safety of machinery -- Safety-related parts of control systems -- Part 2: Validation

Standard	International standards (including the EN, UL, and GB standards)
Reed switch/ Relay/Switch	IEC 62246-1:2015*, Reed switches – Part 1: Generic specification
	IEC 62246-1-1:2013*, Reed switches – Part 1-1: Generic specification – Quality assessment
	IEC 61810-1:2015, Electromechanical elementary relays – Part 1:General and safety requirements
	IEC 61810-2:2017, Electromechanical elementary relays – Part 2:Reliability
	IEC 61810-2-1:2017, Electromechanical elementary relays – Part 2-1:Reliability – Procedure for the verification of B10 values
	IEC 61810-4:201X, Electromechanical elementary relays – Part 4: Reed relays – General and safety requirements (under discussion)
	IEC 60947-5-1:2016, Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices
Environmental test	IEC 61000-4-4:2004*, Electromagnetic compatibilities (EMC) – Testing and measurement techniques – Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
	IEC 61000-4-5:2005*, Electromagnetic compatibilities (EMC) – Testing and measurement techniques – Part 4-5: Testing and measurement techniques - Surge immunity test
	IEC 61000-4-6:2006*, Electromagnetic compatibilities (EMC) – Testing and measurement techniques – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields
	IEC 61373:2010, Railway applications - Rolling stock equipment - Shock and vibration tests
	IEC 60529:2013, Degrees of protection provided by enclosures (IP Code)
	IEC 60077-1:1999, Railway applications – Electric equipment for rolling stock – Part 1: General requirements and general rules
	IEC 60077-2:1999, Railway applications - Electric equipment for rolling stock- Part 2: Electrotechnical components - general rules
	IEC 60571:2012, Railway applications – Electronic equipment used on rolling stock
	IEC 60068-2-1 to 2-27:2006, Environmental testing – Part 2-1 to 2-27: Vibration, Soldering, Robustness of terminations, shock, etc.
	MIL-STD-202F:2002, Test methods standard – Electronic and electrical component parts, Department of defense
EN 45545-2:2013*, Railway applications – Fire protection on railway vehicles – Part 2: Requirements for fire behavior of materials and components	

RELAYS



P21

PCB TYPE

Representative Type : RI
RZDR
RIW



P21,24,37,40,56,58

PLUG-IN TYPE

Representative Type : RB



P43,45,48,50,54,56

STATIONARY TYPE

Representative Type : RB-5ABEC
RB-2D2520C
RB-2D520C



P52,54

MAGNETIC PROXIMITY SWITCHES



P63

VANE TYPE

Representative Type : PSMO-04G2
PSMO-25G
PSMO-E
PSMO-E1H
PSMO-15G



P64,65,68,75

SEPARATE TYPE

Representative Type : PSMS-R G1(T),MP10(T)
PSMS-R E1,M
PSMS-R E1H,M



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MEMORY TYPE

Representative Type : PSMM-RPE1,MP15
PSMM-R E1H
PSMM-M



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CONTROL



P89

UNIT TYPE

Representative Type : RIU



Customized correspondence

P25

LIMIT SWITCHES

Representative Type : PSKU-□R25C□
PIKU-□R25C□



P89

SELECTOR SWITCHES

Representative Type : PLRC-G
PLWG-G



P93,97

COLUMN TYPE

Representative Type : PSMS-RV□G1
PSMS-RV□G1TH
PSMS-MV10TH□



P80

MICRO SWITCHES

Representative Type : PPUU-G



P82

ROD PLUNGER TYPE

Representative Type : PSPD-G
PPMU-G, E



P85

Function and Specification of PCB Type Relays

Construction		PCB TYPE				
Main Market		General Market, Railway Market			Electric Power Market	
Representative Type		RZDR-G10S RZDR-G01S	RZDR-E10S RZDR-E01S	RIW-□25MC	RI-D25T□	RI-□15T□
Appearance						
Incorporated Bestact		R25	R15	R25	R25	R15
Rated Insulation Voltage		250VAC (Power Frequency)			250VAC (Power Frequency)	
Contact Ratings	Rated Operational Current / Voltage	240VAC 0.5A 115VDC 0.3A	240VAC 1A 115VDC 0.5A 230VDC 0.2A	240VAC 0.5A 115VDC 0.3A	240VAC 0.5A 115VDC 0.3A	240VAC 1A 115VDC 0.5A 230VDC 0.2A
	Other Specifications	Refer to page 19.			Refer to page 19.	
Contact Arrangement		1NO, 1NC		1NO1NC, 2NO	1NO	1NO, 1NC
Characteristics	Vibration Resistance	IEC 61373 Category 1Class B		98m/s ² {10G} (20 to 1000Hz)	98m/s ² {10G} (20 to 1000Hz)	
	Shock Resistance	Erroneous Operation	IEC 61373 Category 1Class B		147m/s ² {15G}	147m/s ² {15G}
		Breakdown			980m/s ² {100G}	980m/s ² {100G}
	Insulation Resistance	100MΩ or greater (with 500VDC Megger)			100MΩ or greater (with 500VDC Megger)	
Withstand Voltage (Power Frequency)	1500VAC for 1 minute, (Across Open Contacts: 500VAC)	2000VAC for 1 minute, (Across Open Contacts: 800VAC)		1500VAC for 1 minute, (Across Open Contacts:500VAC)	2200VAC for 1 minute, (Across Open Contacts: 500VAC)	
Coil Voltage		12VDC 24VDC 48VDC		12VDC 24VDC	5VDC 12VDC 24VDC 48VDC	12VDC 24VDC 48VDC
Ambient Temperature (With no freezing or condensation)	Operating	-40 ~ 70°C (With no freezing or condensation)		-20 to +60°C	-20 to +60°C / -40 to +60°C	
	Storage	-60 ~ 85°C (With no freezing or condensation)		-25 to +80°C	-40 to +80°C	
Approx. Weight		20g	40g	60g	15g	35g, 40g
Page		21		24	57	

PCB TYPE

Electric Power Market		Railway Market		
RZDR-E20TC	RZDR-E40TC	RZDR-G□	RZDR-E□D1C	
				
R15		R25	R15	
250VAC (Power Frequency)		250VAC (Power Frequency)		
240VAC 1A 115VDC 0.5A 230VDC 0.2A		240VAC 0.5A 115VDC 0.3A	240VAC 1A 115VDC 0.5A 230VDC 0.2A	
Refer to page19.		Refer to page 19.		
2NO	4NO	3NO, 2NO1NC, 1NO2NC, 3NC	2NO, 2NC	4NO, 4NC
98m/s ² {10G} (20 to 1000Hz)		IEC 61373 Category 1Class B	IEC 61373 Category 1 Class B	
147m/s ² {15G}		IEC 61373 Category 1Class B	IEC 61373 Category 1 Class B	
980m/s ² {100G}				
100MΩ or greater (with 500VDC Megger)		100MΩ or greater (with 500VDC Megger)	100MΩ or greater (with 500VDC Megger)	
2200VAC for 1 minute, (Across Open Contacts: 1000VAC)		1500VAC, for 1minute (Across Open Contacts: 500VAC)	1500VAC for 1 minute, (Across Open Contacts: 800VAC)	
24VDC 48VDC 110VDC		12VDC, 24VDC 36VDC, 50VDC 55VDC, 72VDC 100VDC, 110VDC	24VDC 50VDC 100VDC 110VDC	
-20 to +60°C		T1 : -25 to +70°C T2 : -40 to +70°C	-25 to +60°C	
-40 to +80°C		-40 to +85°C	-40 to +80°C	
60g	130g	75g	60g	130g
58		40	37	

Function and Specification of Plug-In Type Relays

Construction		PLUG-IN TYPE		
Main Market		Electric Power Market	General Market, Railway Market	Steel, Electric Power, Railway Mark
Representative Type		RB-2PET□C	RB-3P5□V2C	RB-3P5□LC
Appearance				
Incorporated Bestact		R15		
Rated Insulation Voltage		250VAC (Power Frequency)		
Contact Ratings	Rated Operational Current / Voltage	240VAC 1A 115VDC 0.5A 230VDC 0.2A		
	Other Specifications	Refer to page 19.		
Contact Arrangement		1NO, 1NO1NC, 2NO, 2NC	2NO1NC, 3NO	
Characteristics	Vibration Resistance	19.6m/s ² {2G} (10 to 150Hz)	44.1m/s ² {4.5G} (10 to 55Hz)	
	Shock Resistance	Erroneous Operation	147m/s ² {15G}	
		Breakdown	294m/s ² {30G}	490m/s ² {50G}
	Insulation Resistance	100MΩ or greater (with 500VDC Megger)		
Withstand Voltage (Power Frequency)	2200VAC for 1minute, (Across Open Contacts: 1000VAC)	2000VAC for 1 minute, (Across Open Contacts: 800VAC)		
Coil Voltage		12VDC 24VDC 48VDC 110VDC	100VDC 110VDC	100VAC 200VAC 24VDC 48VDC 100VDC 200VDC
Ambient Temperature (With no freezing or condensation)	Operating	-20 to +50°C, -20 to +60°C	-25 to +55°C	-10 to +60°C
	Storage	-40 to +80°C	-25 to +75°C	-25 to +70°C
Approx. Weight		140g	120g	120g
Page		56/61	43	54

PLUG-IN TYPE

General Market / Railway Market

RB3P-G□DC



RB4P-G□DC



RB6P-G□DC



R25

250VAC (Power Frequency)

240VAC 0.5A
115VDC 0.3A

Refer to page 19.

2NO1NC, 3NO

2NO2NC, 4NO

6NO, 5NO1NC, 4NO2NC,
3NO3NC, 2NO4NC, 1NO5NC, 6NC

IEC 61373 Category 1 Class B

100MΩ or greater (with 500VDC Megger)

1500VAC for 1 minute,
(Across Open Contacts: 500VAC)

1500VAC for 1 minute
(Across Open Contacts: : 500VAC)

12VDC
24VDC
26VDC
50VDC
100VDC
110VDC

24VDC
50VDC
100VDC
110VDC

110VDC

-25 to +60°C

-40 to +70°C

-40 to +60°C

-40 to +85°C

110g

150g

300g

45

48

50

■ Function and Specification of Stationary Type and Unit Type Relays

Construction		STATIONARY TYPE	
Main Market		General Market, Railway Market	General Market
Representative Type		RB-5ABEC	RB-2D2520C
Appearance			
Incorporated Bestact		R15	R25
Rated Insulation Voltage		250VAC(Power Frequency)	
Contact Ratings	Rated Operational Current / Voltage	220VAC 1A 110VDC 0.5A 220VDC 0.2A	220VAC 0.5A 110VDC 0.3A
	Other Specifications	Refer to page 19.	
Contact Arrangement		Refer to page 55.	1NOx2
Characteristics	Vibration Resistance	49m/s ² {5G}	98m/s ² {10G} (20 to 1000Hz)
	Shock Resistance	Erroneous Operation	147m/s ² {15G}
		Breakdown	490m/s ² {50G}
	Insulation Resistance	100MΩ or greater(with 500VDC Megger)	
Withstand Voltage (Power Frequency)	2000VAC for 1 minute, (Across Open Contacts : 800VAC)	1500VAC for 1 minute, (Across Open Contacts: 500VAC)	
Coil Voltage		100VAC 20VAC 24VDC 48VDC 100VDC 200VDC	12VDC 24VDC 48VDC
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +60°C	
	Storage	-25 to +70°C	-25 to +80°C
Approx. Weight		430g	110g
Page		54	52

STATIONARY TYPE	UNIT TYPE
General Market	General Market, Railway Market
RB-2D520C	RIU
	 
R15	R25
250VAC(Power Frequency)	250VAC(Power Frequency)
220VAC 1A 110VDC 0.5A 220VDC 0.2A	220VAC 0.5A 110VDC 0.3A
Refer to page 19.	Refer to page 19.
1NOx2	Refer to page 26.
98m/s ² {10G} (20 to 1000Hz)	19.6m/s ² {2G} (10 to 55Hz)
147m/s ² {15G}	98m/s ² {10G}
980m/s ² {100G}	
100MΩ or greater(with 500VDC Megger)	100MΩ or greater(with 500VDC Megger)
2000VAC for 1 minute, (Across Open Contacts: 800VAC)	1500VAC for 1 minute, (Across Open Contacts: 500VAC)
12VDC 24VDC 48VDC	12VDC 24VDC
-10 to +60°C	-10 to +60°C
-25 to +80°C	-25 to +80°C
150g	Refer to page 26.
52	25

Function and Specification of Magnetic Proximity Switches

Construction		VANE TYP			SEPARATE TYPE		
Main Market	Railway Market	Elevator Marke		Steel Market	Railway Market	Steel Market	
Representative Type	PSMO-04G2	PSMO-25G	PSMO-15G	PSMO-□E□ PSMO-□E□TH	PSMS-R1G1(T) PSMS-MP10(T)	PSMS-R□E1 or PSMS-R□E1H PSMS-M□ or PSMS-M□T	
Appearance							
Groove Width mm	4	24	14	5, 25 / 25	—		
Groove Depth mm	33	52	52	36, 90, 120 / 120	—		
Installation of Magnet Units	—						
Rated Sensitive Distance mm	—			10		5, 15, 25, 50, 70 / 15, 25, 50, 70	
Maximum Sensitive Distance mm	—			10 to 12		8 to 11, 16 to 24, 30 to 40, 65 to 85, 100 to 110 / 16 to 24, 30 to 40, 65 to 85, 100 to 110	
Contact Arrangement	1NC	1NO / 1NC			1NO		
Rated Insulation Voltage	250VAC (Power Frequency)						
Incorporated Bestact	R25		R15		R25	R15	
Contact Performance	Rated Continuous Current	Refer to page 19.					
	Rated Operating Current						AC
							DC
	Maximum Breaking Current						
	Contact Resistance						
Minimum Operating Current							
Operating Characteristics (mm)	UP—ON	Refer to page 64.	Refer to page 65.	9 to 20, 20 to 29	Refer to page 65 or 79.	Refer to page 71 or 77.	
	UP—OFF			14 to 24, 26 to 35			
	DOWN—ON			9 to 18, 18 to 29			
	DOWN—OFF			3 to 12, 14 to 24			
	Response			6 or less, 12 or less			
Insulation Characteristics	Insulation Resistance	100MΩ or greater (with 500VDC Megger)	5MΩ or greater (with 500VDC Megger)				
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute, (Across Open Contacts: 500VAC)	1500VAC for 1 minute, (Across Open Contacts: 500VAC)	1500VAC for 1 minute, (Across Open Contacts: 800VAC)	1500VAC for 1 minute, (Across Open Contacts: 500VAC)	1500VAC for 1 minute, (Across Open Contacts: 800VAC)	
Vibration Resistance	9.8m/s ² {1G}	19.6m/s ² {2G} (10 to 200Hz)	9.8m/s ² {1G} (10 to 55Hz)/Refer to IEC 61373 Category 1 Class B	Refer to IEC 61373 Category 1 Class B			
Shock Resistance	Erroneous Operation	9.8m/s ² {10G}		98m/s ² {10G} /Refer to IEC 61373 Category 1 Class B	Refer to IEC 61373 Category 1 Class B		
	Breakdown	980m/s ² {100G}	490m/s ² {50G}	980m/s ² {100G} / Refer to IEC 61373 Category 1 Class B			
Standard Vane Detected mm	t1.0 or greater	t1.6×60×100 (t1.2 or greater)	t1.2×60×100 or greater	t1.6 or greater / t2.3×60×100 or greater	—		
Operating Force	—						
Enclosure	Almost equivalent to IP50	Almost equivalent to IP50, IP67		Almost equivalent to IP50, IP67 / IP67	Almost equivalent to IP50, IP67	Almost equivalent to IP67	
Connecting method	Screw Size: 3.5x8 (Screw With Plain/ Spring Washer)	Cable: 0.75mm ² 2 conductors 1m long. (Dustproof type IP 50 without lamp: 2.5m long)	Cable: 0.75mm ² 2 conductors 1m long.	Terminal Block Screw size : M4x8	Cable: 0.75mm ² 2 conductors 1m long.	Cable: 1.25mm ² 2 conductors 1m long. / 0.75mm ² 2 conductors 3m long.	
				Cable: 1.25mm ² 2 conductors 1m long. / 1.25mm ² 2 conductors 2m long. / Heatproof cable (4.6DIA. 0.75mm ² 2 conductors) 3m long			
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +50°C		-10 to +60°C, -25 to +130°C	-10 to +60°C	-10 to +60°C / -25 to +130°C	
	Storage	-10 to +50°C	-25 to +70°C	-25 to +70°C, -40 to +150°C	-25 to +80°C	-25 to +80°C / -40 to +150°C	
Approx. Weight	0.3kg	0.4kg		0.7kg, 0.8kg, 1.0kg / 1.0kg	0.08kg, 0.04kg	0.13kg, 0.22kg, 0.35kg, 0.9kg, / 0.03kg, 0.16kg, 0.45g, 1.4kg, 3kg	
Page	64	65	68	65 / 75	71	71 / 77	

MEMORY TYPE	COLUMN TYPE	MICRO SWITCHES	ROD PLUNGER TYPE			
Elevator / Steel Market	Pillar Machine / Steel Market	Railway Market	Railway Market			
PSMM-RPE1, PSMM-RPE1T2 or PSMM-R3E1H	PSMS-RV□ or PSMS-RV□	PPUU-G	PSPD-G	PPMU-G	PPMU-E	
PSMM-MP15 or PSMM-M□T	PSMS-MV10TH or PSMS-MV10THA					
						

—					
—					

—	M6 STUD / M6 STUD, M8 SCREW	—			
15 (when mounted on non-magnetic materials) / 25, 50, 70	10	—			
8 to 16 (when mounted on non-magnetic materials) / 10 to 35, 10 to 60, 10 to 85	—	—			

1NO	1NO, 1NC	2NO, 1NO1NC, 2NC	4NO, 3NO1NC, 2NO2NC, 1NO3NC, 4NC	1db + Glass sealed contact (5contacts) (NO or NC)
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250VAC (Power Frequency)		R15	R25	R15	Open contact
Refer to page 19.					
5A					
250V, 3A					
110V, 0.5A (Time Constant : 100ms)					
110VDC, 5A (Time Constant : 100ms)					
100mΩ or less					
100VDC 10mA					

Refer to page 74 or 78.	Refer to page 80.	Refer to page 83.	Refer to page 85 or 86.
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100MΩ or greater (with 500VDC Megger) / 5MΩ or greater (with 500VDC Megger)	5MΩ or greater (with 500VDC Megger)	20MΩ or greater (with 500VDC Megger)	100MΩ or greater (with 500VDC Megger)
1500VAC for 1 minute, (Across Open Contacts: 800VAC)	1500VAC for 1 minute, (Across Open Contacts: 500VAC)		2500VAC for 1 minute (Across Open Contacts: 800VAC)
49m/s ² {5G} (10 to 55Hz) / Refer to IEC 61373 Category 1 Class B	Refer to IEC 61373 Category 1 Class B	Refer to IEC 61373 Category 1 Class B	Refer to IEC 61373 Category 1 Class A
98m/s ² {10G} / Refer to IEC 61373 Category 1 Class B	Refer to IEC 61373 Category 1 Class B	Refer to IEC 61373 Category 1 Class B	Refer to IEC 61373 Category 1 Class A

—					
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—	—	3.2N(0.33kg)±1N(0.1kg) (Initial pressure), 5.5N(0.56kg) ±2N(0.2kg) (Stroke: 6.5mm)	2.9N(0.3kg)±1N(0.1kg) (Initial pressure), 4.9N(0.5kg) ±2N(0.2kg) (Stroke: 7mm)	Initial pressure : 2.9N (300gf), Terminal pressure : 7.8N (800gf) (Stroke : 9mm)
---	---	--	--	--

Almost equivalent to IP52, IP67 / IP67	Almost equivalent to IP67	Almost equivalent to IP50		Almost equivalent to IP50 (Except for 1db contact)
Cable: 0.75mm ² 2 conductors 1m long. / 3m long heat-resistant cable (4.6mm outer dia, 0.75mm ² 2 conductors)	General Cable, Heatproof Cable : 0.75mm ² 2 conductors 1m long	Screw size : M3×8	Screw size : M4×6, Connect amp for M4 screw	Screw size : M4×8, Connect amp for M4 screw
-10 to +60°C / -25 to +130°C	-10 to +60°C / -25 to +130°C	-25 to +80°C	-10 to +60°C	
-25 to +80°C / -40 to +150°C	-20 to +80°C -30 to +130°C		-20 to +80°C	
0.12kg, or 0.1kg, / 0.4kg, 0.45kg, 1.6kg, 2.5kg	0.1kg / 0.2kg, 0.25kg / 0.05kg	0.03kg	0.07kg	0.12kg

74 / 78	80	82	85	
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Function and Specification of Limit Switches and Selector Switches

Construction		LIMIT SWITCHES	
Main Market		General Market, Steel Market	General Market, Steel Market
Representative Type		PSKU-R25C	PIKU-R25C
Appearance			
Incorporated Bestact		R25	
Contact Ratings	Rated Insulation Voltage	250VAC(Power Frequency)	
	Rated Operational Current / Voltage	220VAC 0.5A 110VDC 0.3A	
	Other Specifications	Refer to page 19.	
Contact Arrangement		2NO, 1NO1NC, 2NC	2NO, 1NO1NC, 2NC
Switch Action		Spring return	Maintained
Characteristics	Vibration Resistance	9.8m/s ² {1G} (10 to 100Hz)	
	Shock Resistance	Erroneous Operation	59m/s ² {6G}
		Breakdown	980m/s ² {100G}
	Insulation Resistance	5MΩ or greater(with 500VDC Megger)	
Withstand Voltage (Power Frequency)	Across Open Contacts: 500VAC for 1 minute Across Live Parts & Earth: 1500VAC for 1 minute		
Ambient Temperature (With no freezing or condensation)	Operating Temperature	-10 to +80°C	
	Storage	-20 to +80°C	
Enclosure		Almost equivalent to IP56	Almost equivalent to IP56
Approx. Weight		2kg, 4kg, 5kg	2kg
Page		89	89

SELECTOR SWITCHES	
General Market, Steel Market	General Market, Steel Market
PLRC-G	PLWG-G
	
R25	
250VAC(Power Frequency)	
220VAC 0.5A 110VDC 0.3A	
Refer to page 19.	
Min. 1 step (2 contacts), Max. 8 steps (16 contacts)	4 steps (4 contacts)
Maintained	
9.8m/s ² {1G}(10 to 55Hz)	
98m/s ² {10G}	
980m/s ² {100G}	
100MΩ or greater (with 500VDC Megger), All of across open contacts, across reed swithes and across reed switch and earth.	5MΩ or greater (with 500VDC Megger), All of across open contacts, across reed swithes and across reed switch and earth.
Across Open Contacts: 500VAC for 1 minute Across Reed Switches: 1500VAC for 1 minute Across Reed Switch and Earth: 1500VAC for 1 minute	
-20 to +60°C	-10 to +80°C
-30 to +70°C	-20 to +80°C
Almost equivalent to IP40	Almost equivalent to IP56
280g, 330g, 425g, 480g, 575g, 630g, 725g, 780g	2kg
93	97

Power Reed Switch

Bestact

Medium-Capacity (Element)
Type R25
Large-Capacity (Element)
Type R15

Highly Reliable Contact Employing New Materials and Innovative Designs such as Wiping and Hammering Action, Bifurcated Contact and Back-Stop Mechanism

FEATURES

1. Sealed with an inert gas, ensuring freedom from aging and influences exerted by the external environment.
2. The twin contact and wiping effect assures outstanding contact reliability; failure rate is extremely low.
3. Quick action permits a larger make and break capacity and longer service life.
4. Can switch both AC and DC, permitting direct control over a wide range from low level load to electromagnetic power load.

Note: * Refer to page 8.

Medium-capacity type : 24V 1mA to 240VAC 0.5A
(5A making)

NEMA Contact Ratings : C300 (AC) and Q150 (DC)
NEMA HP Ratings : 1/10HP (120Vac) , 1/8HP (240Vac)
Large-capacity type : 24V 1mA to 240VAC 1A
(10A making)

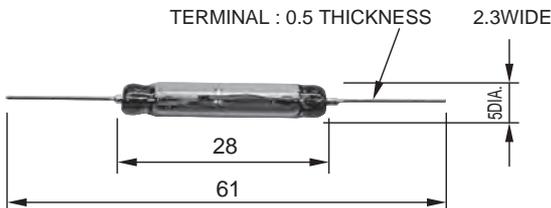
230VDC 40W (Solenoid valve)

NEMA Contact Ratings : C600, B300 (AC) , Q300 (DC)
NEMA HP Ratings : 1/6HP (120Vac) , 1/2HP (240Vac)

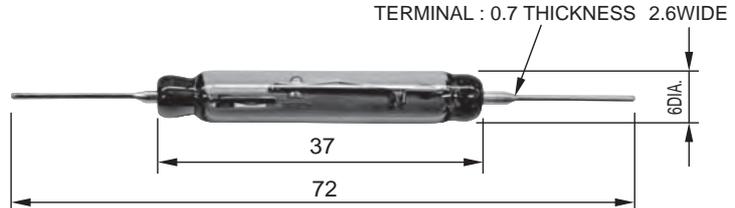
5. Small surge/noise during switching of inductive load.

DIMENSIONS in mm

• Medium-Capacity Type

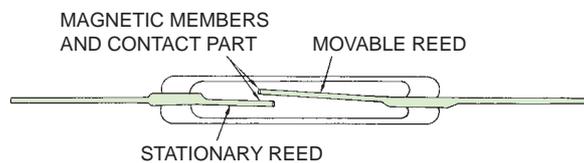


• Large-Capacity Type

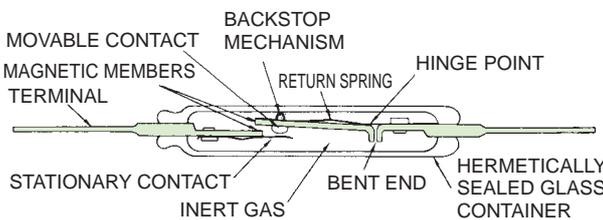


CONSTRUCTION AND OPERATION MECHANISM

Conventional reed switches are constructed simply. The contact for disconnecting current also serves as a magnetic member which constitutes part of a magnetic circuit.

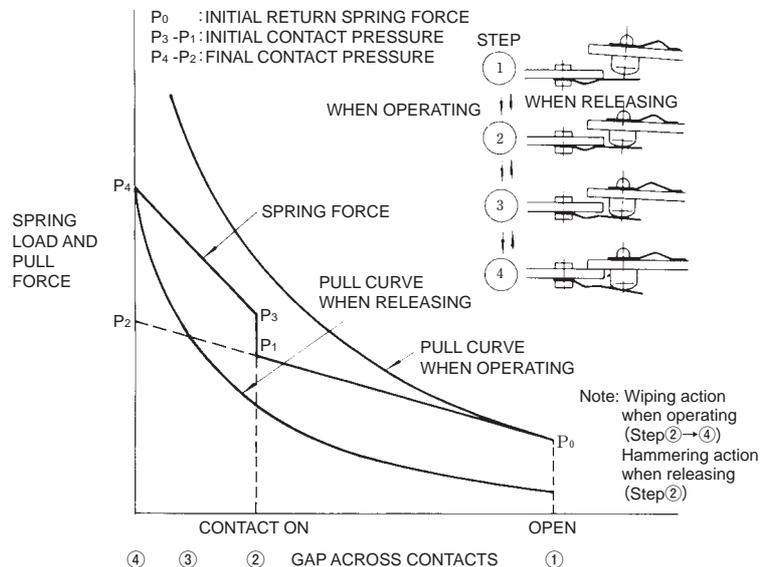


〈Conventional Reed Switch〉



〈Bestact(Large-capacity type)〉

Bestact uses a separate magnetic member and contact unit (carrying current arcing section), each using different materials and designs suited for their functions.



RATINGS AND SPECIFICATIONS

Application		Medium - Capacity Type	Large - Capacity Type	Remarks	
Type		R 25	R 15	—	
Contact Arrangement		1NO	1NO		
Contact Performance					Power Frequency
Contact Performance	Rated Insulation Voltage *1		250VAC	250VAC	Power Frequency
	Rated Continuous Current *2		3A	5A	
	Rated Operational Current *3	AC	240V 0.5A	240V 1A	Inductive Load (AC50/60Hz)
		DC	115V 0.3A	115V 0.5A, 230V 0.2A	Inductive Load (Medium-capacity : L/R=40ms, Large-capacity : L/R=100ms)
	Maximum Making Current *4		240VAC 15A	240VAC 30A	Power factor 0.3 to 0.4 (AC50/60Hz)
	Maximum Breaking Current *5	AC	240V 15A	240V 30A	Power factor 0.3 to 0.4 (AC50/60Hz)
		DC	115V 0.5A	115V 0.6A 230V 0.4A	Medium-capacity : L/R=40ms Large-capacity : L/R=100ms
	Minimum Operational Power Ratings *6		24V 1mA 5V 10mA *	24V 1mA 5V 10mA *	Failure Rate $\lambda_{60}=4.6 \times 10^{-9}$ (time) or less *7 *In circuit with photo coupler for digital application.
Withstand Voltage Across Contacts		500VAC for 1minute	800VAC for 1minute	Power Frequency	
Insulation Resistance		$10^9 \Omega$ or greater	$10^9 \Omega$ or greater	with 500VDC Megger	
Initial Contact Resistance		500m Ω or less	500m Ω or less	6VDC 1A	
Operating Characteristics	Pick-up Magnetomotive Force		100 to 130A	180 to 230A	Yaskawa standard coil is of 3000 turns, 33.5mm long, 10.5mm I.O. with 0.2mm dia. wire A: A value, called ampere-turn, which indicates pick-up magnetomotive force and drop-out magnetomotive force
	Drop-out Magnetomotive Force		50A or greater	60A or greater	
	Operating Time		4ms or less (Bounce Time not included)	5ms or less (Bounce Time not included)	at 150% of pick-up ampere turn using standard coil (Equipped with a flywheel diode)
	Releasing Time		2ms or less	3ms or less	
Mechanical Life		Over 100,000,000 operations	Over 100,000,000 operations	—	
Mechanical Performance	Vibration Resistance		147m/s ² 15G	196m/s ² 20G	20 to 1000Hz
	Shock Resistance		196m/s ² 20G (980m/s ² 100G)	392m/s ² 40G (980m/s ² 100G)	Value in parenthesis indicates breakdown G
	Terminal Drawing Force		98N 10kg fl	98N 10kg fl	—
Ambient Temperature	Operating Temperature		-50 to +150°C	-50 to +150°C	—
	Storage		-60 to +180°C	-60 to +180°C	—

Note: Ratings and specifications are defined according to IEC 62246-1.

- * 1. Rated insulation voltage is the voltage value which is the standard of insulation design and defined by the withstand voltage test.
- * 2. Rated continuous current is the current value which can be energized continuously without exceeding the allowable temperature rise under the condition without breaking contacts.
- * 3. Rated operational current is the current value which is combined with a rated operational voltage and used in regulated conditions (making/breaking current, switching frequency and electric switching durability).
At 240VAC, the current is set at 10 times this value upon making (PF: 0.6 to 0.7) and 1 times this value upon breaking (PF: 0.3 to 0.4). Rated operational current 1A means 10A making and 1A breaking. At 115VDC, the current is set at 1 times making and 1times breaking and indicated by inductive load (L/R=40ms and 100ms).
- * 4. Maximum making current is the current value which enables 10 times making at 240VAC and PF: 0.3 to 0.4 by referring to IEC 62246-1-1.
- * 5. Maximum breaking current is the current value which enables 10 times breaking at 240VAC and PF: 0.3 to 0.4 by referring to IEC 62246-1-1.
- * 6. Minimum operational power ratings are the values which can be surely energized under the regulated load conditions that the class of contact reliability keeps a failure rate 0.005 (time/10⁶) or less.
- * 7. Refer to page 20.

TYPICAL APPLICATIONS

Problems on reliability which cannot be solved even by semi-conductors or photo-electric switches can be solved with Bestact.

- (1) Rolling stocks and railway signals (Refer to the application examples in our catalogue 'Railway Control Devices with Bestact' .)
 - Main circuit devices (Pantographs, main breakers, VVVF inverter drives) and auxiliary contacts
 - Control relays for Automatic Train Stop (ATS), Automatic Train Control (ATC) and Automatic Train Operation (ATO)
 - Door control devices (Door interlock switches and semiautomatic door switches)
 - Position detecting switches for Threshold obstruction detectors
 - Control relays for obstruction warning devices for level crossing
- (2) Electric power facilities (Refer to the application examples in our catalogue 'Electric Power Facilities with Bestact' .)
 - Digital protective relay devices (Trip relays for breaker)
 - Protective relays for monitoring distribution control system
 - Electric power plant equipment (ON/OFF confirmation disconnect switches and control devices for breakers)
- (3) Elevators (Refer to the application examples in our catalogue 'Elevators and Parking Machines with Bestact' .)
 - Safety devices for elevators (landing-zone/door-zone detector switches)
 - Stop position detectors of car pallets in parking structures
- (4) Iron and steel facilities (Refer to the application examples in our catalogue 'Harbor Facility, Iron, Steel and Cement making plants with Bestact' .)
 - Harbor facilities (Selector switches and position detecting switches for loader/unloader, crane and belt conveyor)
 - Raw material yard equipment (Selector switches and position detecting switches for conveyor and tramcar)
 - Iron making plant equipment (Selector switches and position detecting switches for hot strip mill, cold strip mill and hot-dip galvanization)
- (5) Petrochemistry market
 - Oil pipeline equipment (Selector switches)
 - Chemical factory equipment (Valve open/close position detecting switches)
- (6) Machinery safety switches
 - Food processing, semiconductor manufacturing and metal cutting machines (Guard interlock switches)
 - Industrial robots
- (7) General industries
 - Waterworks and sewage equipment (Control relays)
 - Medical equipment (Foot switches)
 - Aircraft avionics
 - Cylinder position detection switches

ELECTRICAL LIFE

Electrical life tabulated below is B₁₀ value in a single test (at the condition shown in IEC 62246-1-1) at Yaskawa. It is not a value in a multiple environment such as temperature and vibration. It is necessary to test actual products before initial operation.

The circuit that drives coils adopts a direct making method which applies rated coil voltage (instant ON and instant OFF). In the circuit where the voltage applied to coils gradually increases or decreases, electrical life might decrease.

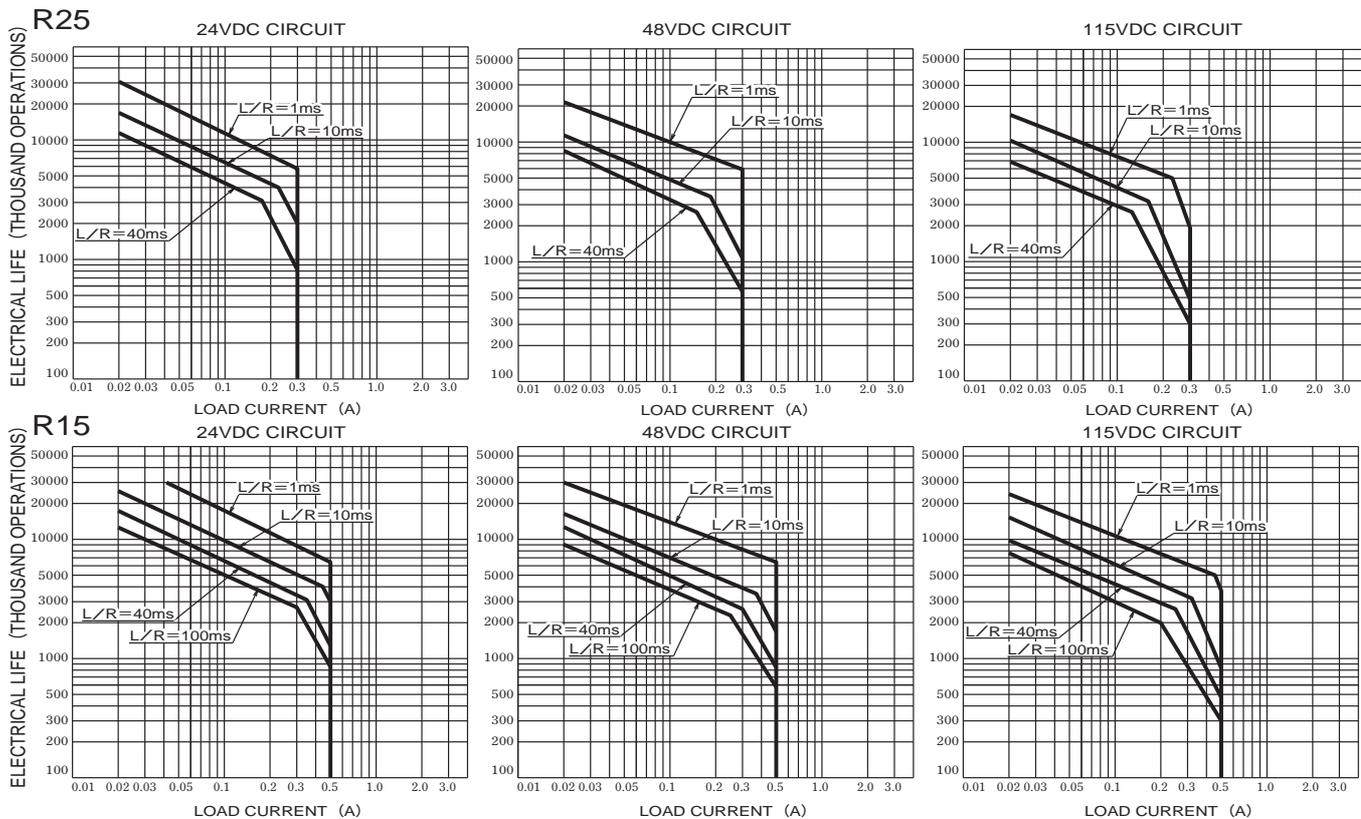
1. ELECTRICAL LIFE WHEN APPLYING TYPICAL LOADS

Voltage	Marking		Breaking		Life (Thousand Operations)	
	Current (A)	Power Factor or Time Constant	Current (A)	Power Factor or Time Constant	R25	R15
240VAC (Inductive Load)	10	PF=0.7	1	PF=0.4	—	800
	5		0.5		1000	1500
	2.5		0.25		2000	3000
110VAC (Inductive Load)	10	PF=0.7	1	PF=0.4	—	800
	5		0.5		1000	2000
	2.5		0.25		2000	4000
110VAC (Resistive Load)	3	PF=1.0	3	PF=1.0	—	200
	2		2		200	1000
	1		1		500	2000
115VDC (Resistive Load)	0.5	L/R = 1ms	0.5	L/R = 1ms	—	3500
	0.3		0.3		2000	6000
115VAC (Inductive Load)	0.02	Relay coil	0.012	Relay coil	30000	60000
24VDC (Inductive Load)	0.037	Relay coil	0.037	Relay coil	15000	30000

Note: 1. Values of DC inductive loads tabulated above are the ones where stationary contact side is of positive polarity.

2. The values can not be applied in case inrush current is generated.

2. ELECTRICAL LIFE WHEN APPLYING DC CIRCUIT (Type R25 · R15)



Failure rate (λ)

Rate of failures per unit time during continuous number of operations under individually specified test types and loads. (Refer to JIS C 5003)

$$\text{Failure rate } (\lambda) = \frac{\text{No. of failures}}{\text{No. of tested contacts} \times \text{number of operations}} \quad [/ \text{time}]$$

* Tested hour (H) $\times 10^{-9}$ can be used instead of number of operations. (Unit: Fit)

INPUT/OUTPUT RELAYS

Medium-Capacity RZDR-G10S,RZDR-G01S
Large-Capacity RZDR-E10S,RZDR-E01S

Highly Reliable Interface Relays for Programmable Controllers and Microcomputer Control Systems

FEATURES

1. Assures outstanding reliability in circuits of 100VAC/DC or greater as well as in electronic component circuits.
2. Directly controls over a wide range from TTL electronic level to large magnetic contactors or DC solenoid valves.
3. No output relay board needed.
4. Quick action in 5ms or less.
5. Excellent insulation characteristics. Withstand voltage across coil and contact: 2000VAC or greater.
(Medium-capacity type: 1500VAC or greater)
6. Automatic wave-soldering.
7. Small driving power.
(Medium-capacity type: 0.4W, Large-capacity type: 0.6W)



TYPICAL APPLICATIONS

- I/O relays for industrial programmable controllers
- I/O relays for microcomputer modified equipment
- Trip relays for circuit breakers
- Recording and transmitting relays for electric power facilities
- I/O relays for NC/MC controllers

RATINGS AND SPECIFICATIONS

Capacity		Medium-Capacity Type		Large-Capacity Type	
Type		RZDR-G10S	RZDR-G01S	RZDR-E10S	RZDR-E01S
Contact Arrangement		1NO	1NC	1NO	1NC
Incorporated Bestact		R25		R15	
Rated Insulation Voltage		250VAC (Power Frequency)		250VAC (Power Frequency)	
Contact Performance		Refer to page 19.			
Characteristics	Vibration Resistance	IEC 61373 Category 1Class B			
	Shock Resistance	IEC 61373 Category 1Class B			
	Insulation Resistance	100MΩ or greater (with 500VDC Megger)		100MΩ or greater (with 500VDC Megger)	
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute, (Across Open Contacts: 500VAC)		2000VAC for 1 minute, (Across Open Contacts: 800VAC)	
Ambient Temperature (With no freezing or condensation)	Operating	-40 ~ 70°C (With no freezing or condensation)			
	Storage	-60 ~ 85°C (With no freezing or condensation)			
Approx. Weight		20g		40g	

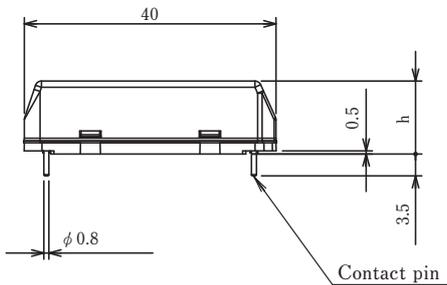
COIL SPECIFICATIONS (With polarity)

Type	Medium-Capacity						Large-Capacity					
	RZDR-G10S			RZDR-G01S			RZDR-E10S			RZDR-E01S		
Rated Voltage (E) V	12	24	48	12	24	48	12	24	48	12	24	48
Coil Resistance Ω	405	1520	5530	295	1160	4060	250	1020	3980	285	1080	3640
Rated Power Consumption W	0.4		0.5	0.5		0.6	0.6			0.6		0.7
Voltage Variation Range	S : 90 ~ 110%											
Maximum Allowable Voltage	170%E (Ta=20°C cold start) Approx.1.2W			150%E (Ta=20°C cold start) Approx.1.1W			220%E (Ta=20°C cold start) Approx.3W			150%E (Ta=20°C cold start) Approx.1.3W		
	140%E (cold / hot start within the range of service temperature)											
Operating Voltage	90%E or less (cold / hot start within the range of service temperature)											
Releasing Voltage	22.9%E or greater (Ta=20°C cold start)			10%E or greater (Ta=20°C cold start)			22.9%E or greater (Ta=20°C cold start)			10%E or greater (Ta=20°C cold start)		
	5%E or greater 60%E or less (cold / hot start within the range of service temperature)											

- Note:
1. Values tabulated above indicate operations at ambient temperature of 20°C.
 2. Coil resistance values can vary by $\pm 10\%$.
 3. Maximum allowable voltage is the maximum value that can be applied to the coil in consideration of its thermal degradation and insulators in the relays.
This is not a continuous allowable voltage.
 4. Type RZDR-E01S and RZDR-G01S may erroneously operate if the maximum allowable voltage is exceeded even for a short time.

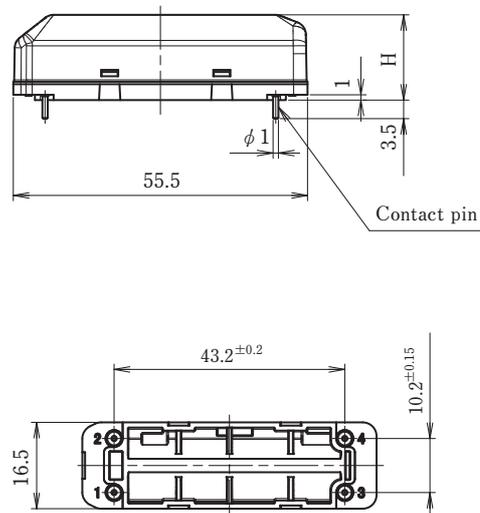
DIMENSIONS in mm

• Medium-Capacity Type



Type	RZDR-G10S	RZDR-G01S
Din	h	h
	11.7	13.2

• Large-Capacity Type



Type	RZDR-E10S	RZDR-E01S
Din	H	H
	16	17

NOTES FOR INSTALLATION

(1) Connections

Coils have a polarity. Connect as shown below for proper operation. Refer to (2) for a polarity of the connecting terminals.

RZDR-G10S	
RZDR-G01S	
RZDR-E10S	
RZDR-E01S	
RI-D25T1C	
RI-B15T1C RI-B15T2C	
RI-C15T1C	

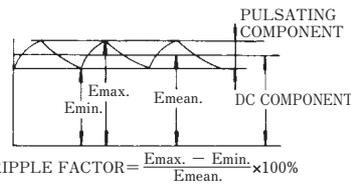
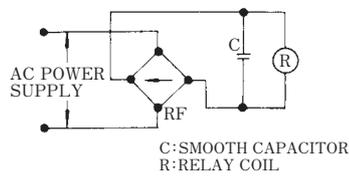
* BOTTOM VIEW

(2) Terminal connections for DC loads

Type	Terminal No.		
	2	5	1
RZDR-G10S	+	—	—
RZDR-G01S	+	—	—
RZDR-E10S	+	—	—
RZDR-E01S	+	—	—
RI-D25T1C	+	—	—
RI-B15T1C	+	—	—
RI-B15T2C	+	—	—
RI-C15T1C	+	—	—

(3) Coil energizing sources

For proper coil excitation, use a genuine DC power supply such as battery or three-phase full-wave rectified source whose ripple factor is 5% or less. If single-phase full-wave rectified source is used, a smoothing capacitor is needed to control the ripple to 5% or less.

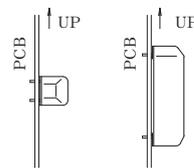


Emax.: MAX. VALUE OF PULSATING COMPONENT
Emin.: MIN. VALUE OF PULSATING COMPONENT
Emean.: DC MEAN VALUE

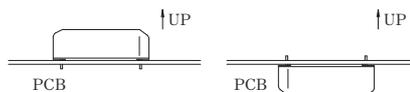
(4) Direction of mounting

The standard mounting direction is shown in figure (a) below.

Where placing the relay mounting board horizontally as shown in figure (b), the operational voltage and releasing voltage may change as much as 5% compared with the standard mounting direction.



(a) Where placing board vertically (Standard)



(b) Where placing board horizontally

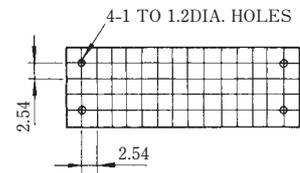
(5) External magnetic field

Although RI relays and RZDR single pole relays are magnetically sealed, avoid using them in the strong external magnetic field. That might result in erroneous operations.

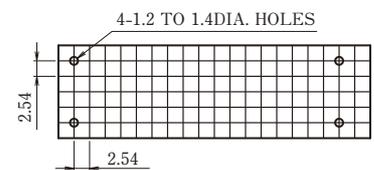
(6) Mounting on printed circuit board

• Medium-Capacity Type

Unit: mm



• Large-Capacity Type



(7) Usage except for mounting on printed circuit boards

Where not mounted on the printed circuit boards, mount and wire so as not to apply any force to the relay terminals.

Avoid bending the ends of the terminals.

(8) Making / Breaking ratings

Contact welding and glass crack might occur when these relays are used beyond the range of rated current such as maximum making current and maximum breaking current. Use these relays within the range of rated current.

⚠ CAUTION

Do not apply excessive force (29.4N {3kgf} or greater tensile force) to the relay terminals.

⊘ RESTRICTION

Use coils and contacts within the range of ratings. Coil breaking, burnout, contact welding and contact meltdown might occur when used at the value exceeding ratings.

TWO POLE TYPE INPUT/OUTPUT RELAYS

Type RIW

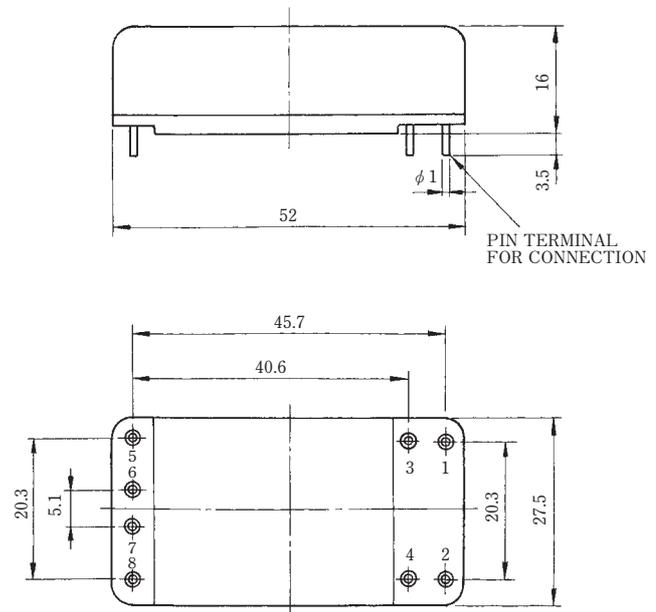
Bestact Two Pole Type I/O Relays are widely used for railway signals.



RATINGS AND SPECIFICATIONS

Type	RIW-F25MC	RIW-G25MC
Contact Arrangement	1NO1NC	2NO
Incorporated Bestact	R25	
Rated Insulation Voltage	250VAC (Power Frequency)	
Contact Performance	Refer to page 19.	
Vibration Resistance	98m/s ² {10G} (20 to 1000Hz)	
Shock Resistance	Erroneous Operation	147m/s ² {15G}
	Breakdown	980m/s ² {100G}
Insulation Resistance	100MΩ or greater (with 500VDC Megger)	
Withstand Voltage	1500VAC for 1 minute, (Across Open Contacts:500VAC)	
Ambient Temperature (With no freezing or condensation)	Operating	-20 to +60°C
	Storage	-25 to +80°C
Approx. Weight	60g	

DIMENSIONS in mm

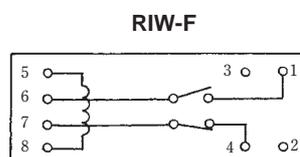


COIL SPECIFICATIONS (With polarity)

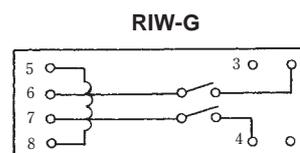
Type	RIW-F		RIW-G	
Rated Voltage (E)	12V	24V	12V	24V
Rated Power Consumption	1W			
Maximum Allowable Voltage	130%E 1.7W			
Operating Voltage	75%E or less			
Releasing Voltage	5%E or greater			

- Note:
- Values tabulated above indicate operations at ambient temperature of 20°C.
 - Each of NO and NC contact is independent. Therefore, the operating time of NO contact and NC contact may overlap.
 - Maximum allowable voltage is the maximum value that can be applied to the coil in consideration of its thermal degradation and insulators in the relays. This is not a continuous allowable voltage. Relays incorporating NC contact may erroneously operate if the maximum allowable voltage is exceeded even for a short time.

• Symbols and terminal markings (bottom view)



- Note:
- For connection to coil terminals, connect terminal number 5 to ⊖ and terminal number 8 to ⊕.
 - For application to a DC circuit, connect terminal number 1 and 4 to ⊕ and terminal number 6



PRECAUTION FOR USE

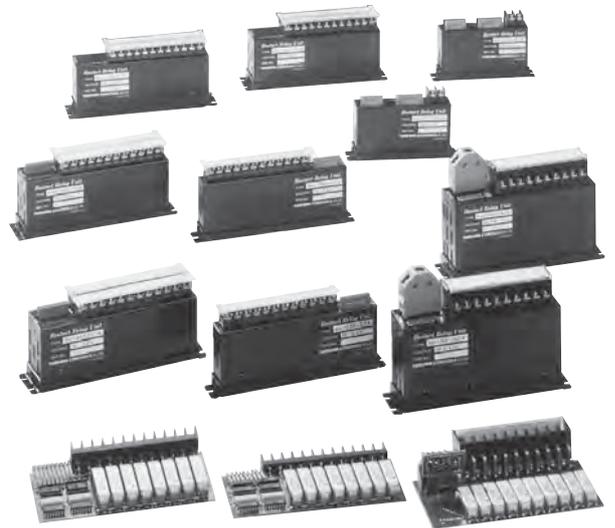
Refer to (3), (4), (5), (7), (8), CAUTION and RESTRICTION on page 23.

RELAY UNIT RIU SERIES

High Density Mounting Design Incorporating High Reliable Relays.
Best Suited to I/O Relay Units for Microcomputer Boards,
PC and NC Control Boards.

FEATURES

1. 4, 8, 10 and 16 contacts per unit, high density mounting design.
2. Can be energized using TTL electronic level signals or open collector input.
3. Also available in a photocoupler isolation type.
4. Minimum space needed due to compact size.
5. Provided with operational display (LED).
6. Features of the incorporated relay units:
 - Hermetically sealed contacts assure long-term reliability even in adverse environments.
 - Large-capacity switching permits direct switching of large magnetic contactors, DC solenoid valves, etc.
 - Surgeless switching
The unique breaking mechanism minimizes surge when magnetic coil is opened.



RELAY UNIT RIU SERIES

COMMON SPECIFICATIONS

- Operating voltage: 24VDC or 12VDC
- Voltage fluctuation range: Rated voltage -15% to +10%
- Operating temperature range: -10 to +60°C
- Operating humidity range: 85%RH or less
- Storage temperature range: -25 to +80°C
- Vibration resistance: 19.6m/s² {2G} (10 to 55Hz)
- Shock resistance: 98.0m/s² {10G}

Note: When using contacts in a DC circuit, please connect these units in connect polarity according to "PRECAUTIONS FOR USE" 4 on page 36.

TYPE DESIGNATION

RIU - C / -

Rohs compliant

FIGURE

- A** **B** Encased-type; connector input
- C** Encased-type; screw terminal input
- E** Open-type; screw terminal input
- F** **G** Open-type; connector input

NUMBER OF CIRCUITS

- 0 4** 4 circuits
- 0 8** 8 circuits
- 1 0** 10 circuits
- 1 6** 16 circuits

SUPPLY VOLTAGE

- 1 2** 12VDC
- 2 4** 24VDC

CONTACT SPECIFICATIONS

- None** All circuits use NO contact relays
- 2 2** 2NO contact relays 2NC contact relays
- 4 4** 4NO contact relays 4NC contact relays
- 6 2** 6NO contact relays 2NC contact relays

INPUT SPECIFICATIONS

- E** TTL input (non-isolated)
- F** TTL input (isolated)
- G** Open collector input (non-isolated)
- H** Open collector input (isolated)

Note: Although various combinations are imaginable, all we manufacture for standard types are the ones shown in "CONTACT CONFIGURATION DIAGRAM" on page 29 to 34.

MODEL LIST

Appearance	Figure	Supply Voltage	Contact Configuration	Input Circuit Configuration	Input Signal	Weight (g)
 RIU-04EC	Open	12VDC 24VDC	· 4NO · 2NO 2NC	2 circuits common × 2	· Open collector type (or contact)	200
 RIU-08AC	Encased	12VDC 24VDC	· 8NO · 4NO 4NC · 6NO 2NC	8 circuits common × 1	· TTL type · Open collector type (or contact)	600
 RIU-08BC	Encased	12VDC 24VDC	· 8NO	8 circuits common × 1	· TTL type · Open collector type (or contact)	500
 RIU-08CC	Encased	12VDC 24VDC	· 8NO · 4NO 4NC · 6NO 2NC	8 circuits common × 1	· TTL type · Open collector type (or contact)	600
 RIU-08EC	Open	12VDC 24VDC	· 8NO · 4NO 4NC · 6NO 2NC	2 circuits common × 4	· Open collector type (or contact)	300
 RIU-08FC	Open	12VDC 24VDC	· 8NO · 4NO 4NC · 6NO 2NC	8 circuits common × 1	· Open collector type (or contact)	300
 RIU-08GC	Open	12VDC 24VDC	· 8NO · 4NO 4NC · 6NO 2NC	8 circuits common × 1	· TTL type · Open collector type (or contact)	300
 RIU-10AC	Encased	12VDC 24VDC	· 10NO	10 circuits common × 1	· Open collector type (or contact)	800
 RIU-16AC/G24	Encased	24VDC	· 16NO	16 circuits common × 1	· Open collector type (or contact)	950
 RIU-16FC/G24	Open	24VDC	· 16NO	4 circuits common × 4	· Open collector type (or contact)	600

RATINGS AND SPECIFICATIONS

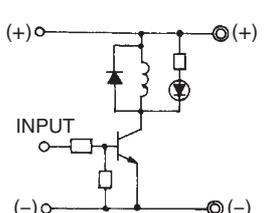
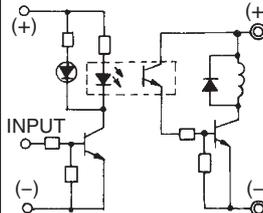
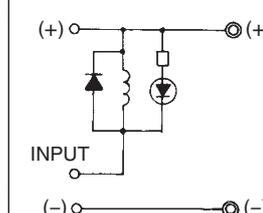
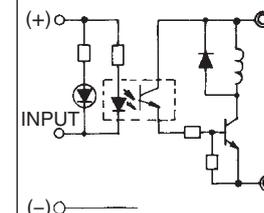
• ENCASED TYPE

Specifications		Type	RIU-08AC/□	RIU-08BC/□	RIU-08CC/□	RIU-10AC/G□	RIU-16AC/G24
Number of Circuits			8	8	8	10	16
Output Specifications	Rated Carrying Current Capacity		2.5A per circuit	2A per circuit 4A for common line		2.5A per circuit	
	Contact Capacity	240VAC 0.5A 115VDC 0.3A					
	Terminal Style	Screw terminal					
	Power Supply	24VDC or 12VDC					24VDC
Input Specifications	Circuit Configuration		8 circuits common × 1			10 circuits common × 1	16 circuits common × 1
	Input Signal		· TTL type · Open collector type (or contact)			Open collector type (or contact)	
	Terminal Style		Connector		Screw terminal	Connector	
	Operation Display	With operation display (LED)					

• OPEN TYPE

Specifications		Type	RIU-04EC/G□	RIU-08EC/□	RIU-08FC/□	RIU-08GC/□	RIU-16FC/G24
Number of Circuits			4	8			16
Output Specifications	Rated Carrying Current Capacity		2.5A per circuit		2A per circuit 4A for common line		
	Contact Capacity	240VAC 0.5A 115VDC 0.3A					
	Terminal Style	Screw terminal					
	Power Supply	24VDC or 12VDC					24VDC
Input Specifications	Circuit Configuration		2 circuits common × 2	2 circuits common × 4	8 circuits common × 1		4 circuits common × 4
	Input Signal		Open collector type (or contact)			· Open collector type (or contact) · TTL type	Open collector type (or contact)
	Terminal Style		Screw terminal		Connector		
	Operation Display	With operation display (LED)					

INPUT SPECIFICATIONS

Input Specifications		CMOS, TTL Drive Type		Open Collector, Contact Drive Type	
		Non-isolated	isolated	Non-isolated	isolated
Type	For 4 Circuits	—	—	RIU-04□C/G□	—
	For 8 Circuits	RIU-08□C/E□	RIU-08□C/F□	RIU-08□C/G□	RIU-08□C/H□
	For 10 Circuits	—	—	RIU-10□C/G□	—
	For 16 Circuits	—	—	RIU-16□C/G24	—
Isolation		—	Photocoupler isolated	—	Photocoupler isolated
Input Level		H-2.5V or greater L-1.0V or less		24VDC 25mA (per circuit) 12VDC 50mA (per circuit)	24VDC 10mA 12VDC 5mA
Input Impedance		10.5kΩ			
Input Power Supply		—	12 to 24VDC	—	12 to 24VDC
Relay Power Supply		24VDC or 12VDC*			
1 Circuit Diagram (○ shows an input terminal ◎ shows an output terminal)					

Note: Relay power supply of type RIU-16 □G24 is only 24VDC.

OUTPUT SPECIFICATIONS (RELAY RATINGS)

	Specifications	
Contact Arrangement	NO	NC
Type of Relay	RI-D25MC	RI-E25MC
Incorporated Bestact	R25	
Rated Insulation Voltage	250VAC (Power Frequency)	
Contact Performance	Refer to page 19.	
Operating time	OFF→ON time: 5ms or less ON→OFF time: 5ms or less	

FIGURE SPECIFICATIONS

Two types of the relay units are available: encased type that incorporates printed circuit boards in cases and open type that is not encased. Select either type according to the mounting area and operational environment.

Figure Specification No of Circuits	Encased Type			Open Type		
	Connector Input	Connector Input	Screw Terminal Input	Screw Terminal Input	Connector Input	Connector Input
4 circuits	—	—	—	RIU-04EC/□	—	—
8 circuits	RIU-08AC/□	RIU-08BC/□	RIU-08CC/□	RIU-08EC/□	RIU-08FC/□	RIU-08GC/□
10 circuits	RIU-10AC/□	—	—	—	—	—
16 circuits	RIU-16AC/G24	—	—	—	RIU-16FC/G24	—

CONTACT SPECIFICATIONS

4, 8, 10 and 16 circuit types are available. Both NO and NC contact relays are available in the units. Select the unit best suited for your application.

Relay Type	Relay Configuration	Relay No. in Circuit Diagram	
		Relay No. of NO	Relay No. of NC
RIU-04EC/□	4NO	RY 1 to RY 4	—
	2NO 2NC	RY 1 to RY 2	RY 3 to RY 4
RIU-08AC/□ RIU-08CC/□ RIU-08EC/□ RIU-08FC/□ RIU-08GC/□	8NO	RY 1 to RY 8	—
	4NO 4NC	RY 1 to RY 4	RY 5 to RY 8
	6NO 2NC	RY 1 to RY 6	RY 7 to RY 8
	8NO	RY 1 to RY 8	—
RIU-10AC/□	10NO	RY 1 to RY 10	—
RIU-16AC/G24 RIU-16FC/G24	16NO	RY 1 to RY 16	—

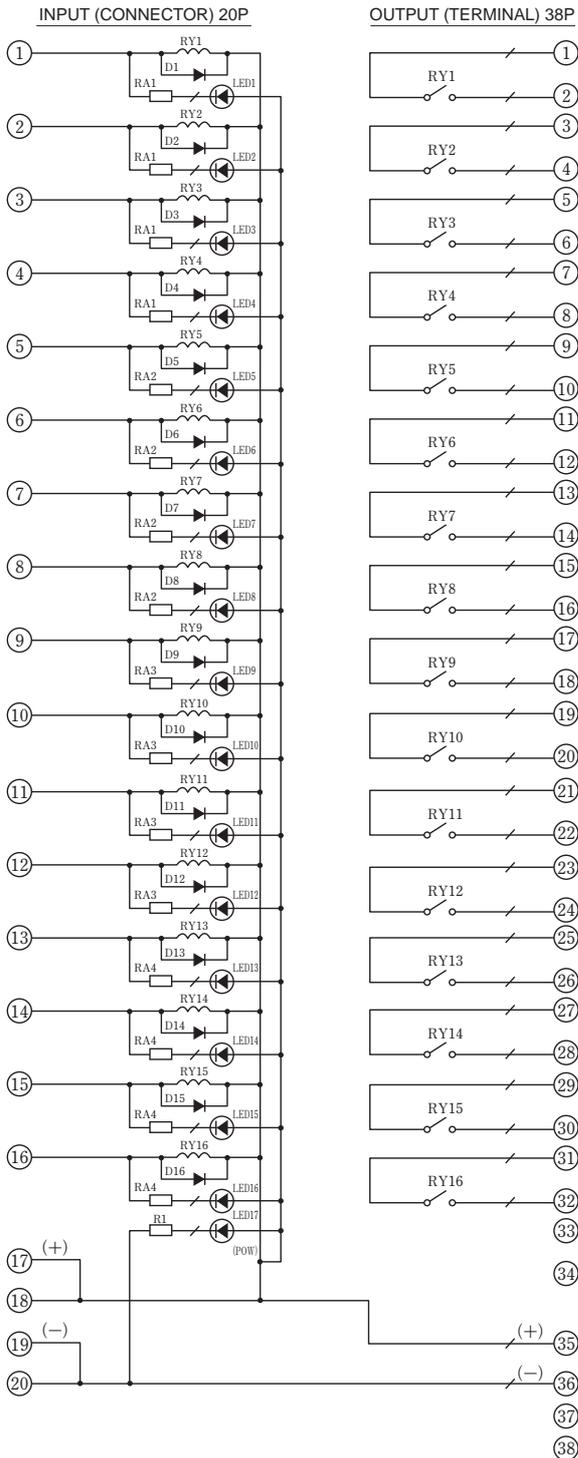
Note: 1. In the 8 circuit series, NC contact type is not available for Type RIU-08BC/□. In that case, select the Type RIU-08AC/□ or RIU-08CC/□.
2. Type RIU-08AC/□, -10AC/□, -16AC/G24, -04EC/G□ and -08EC/□ have independent output contacts. All other series have common output contacts.
For details, refer to the circuit configuration diagram.

CIRCUIT CONFIGURATION DIAGRAM

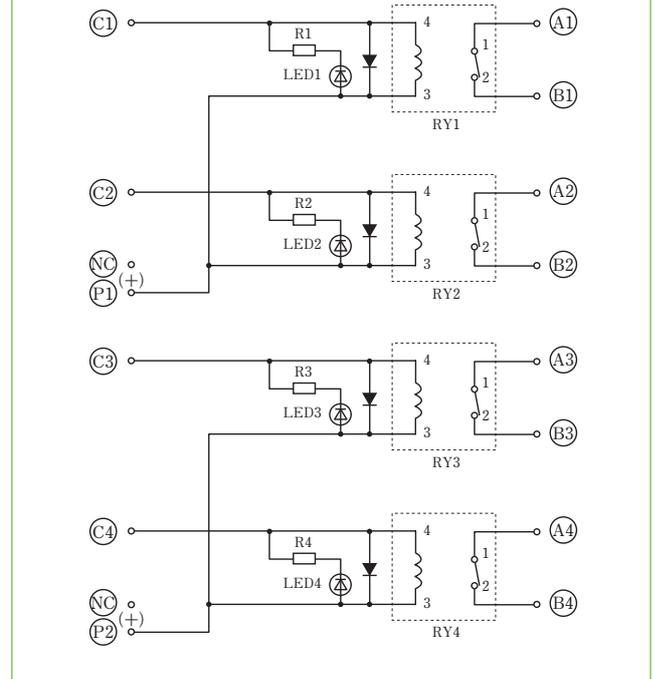
When NC contacts are combined, dashed boxes () in all the circuit configuration diagrams will be NC relays.

Type	Relay Specification	NO Contact Relays	NC Contact Relays
	RIU- ()	All Circuits	—
	RIU- ()-22	RY 1 to RY 2	RY 3 to RY 4
	RIU- ()-44	RY 1 to RY 4	RY 5 to RY 8
	RIU- ()-62	RY 1 to RY 6	RY 7 to RY 8

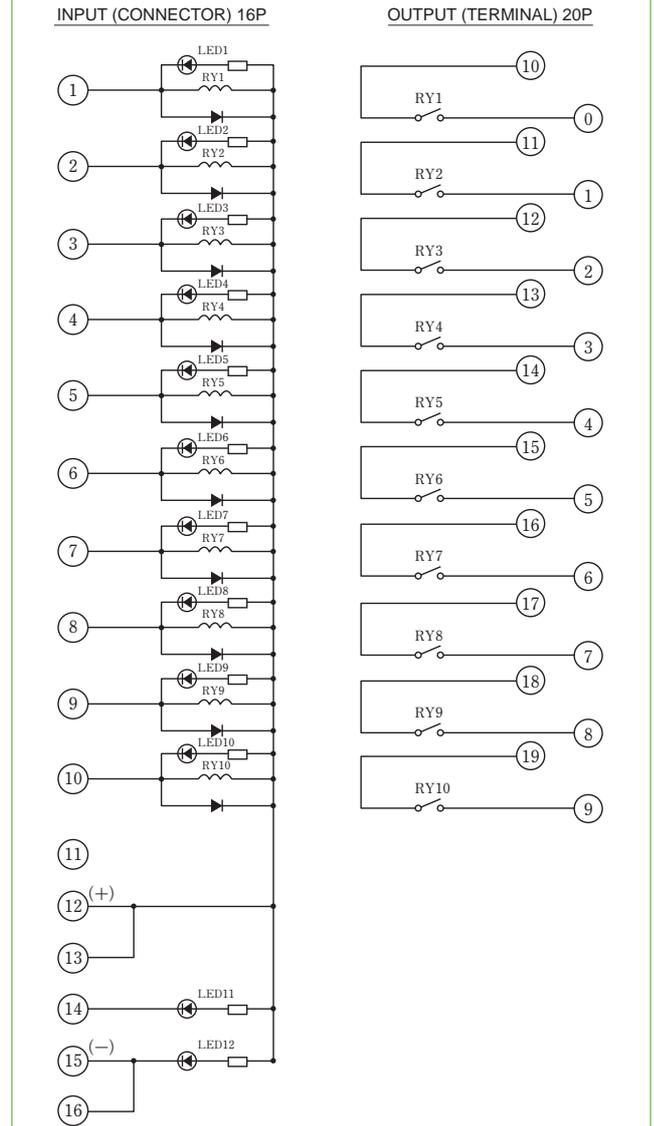
• Type RIU-16AC/G ()

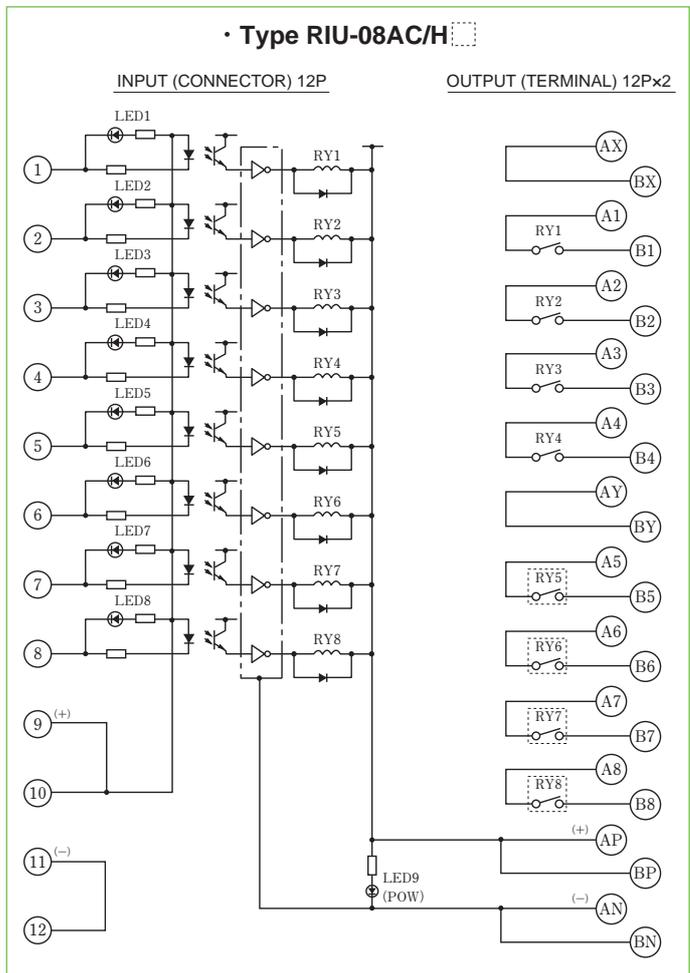
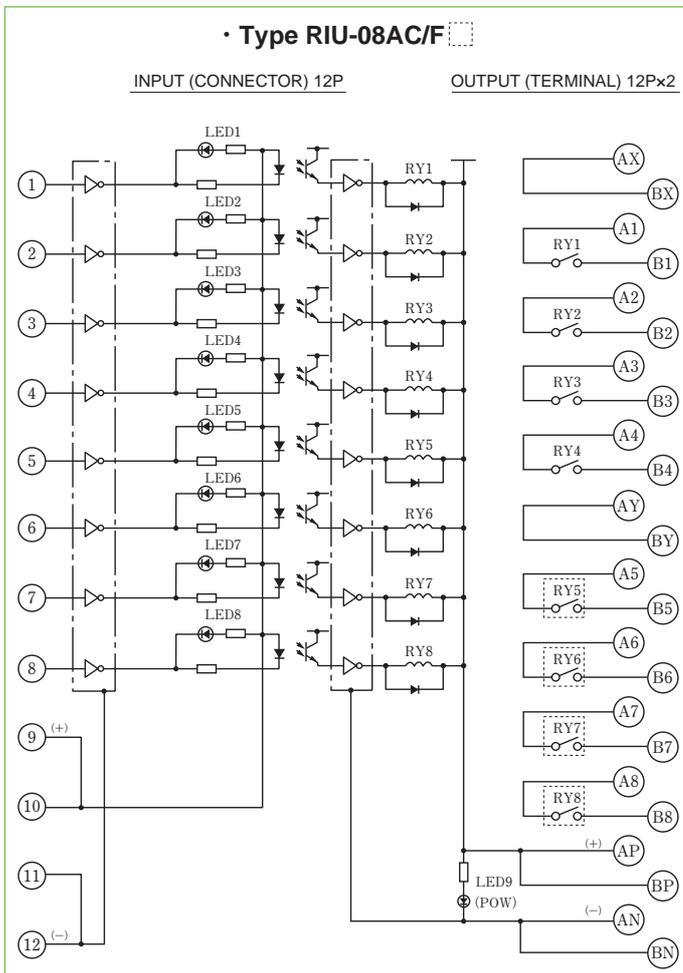
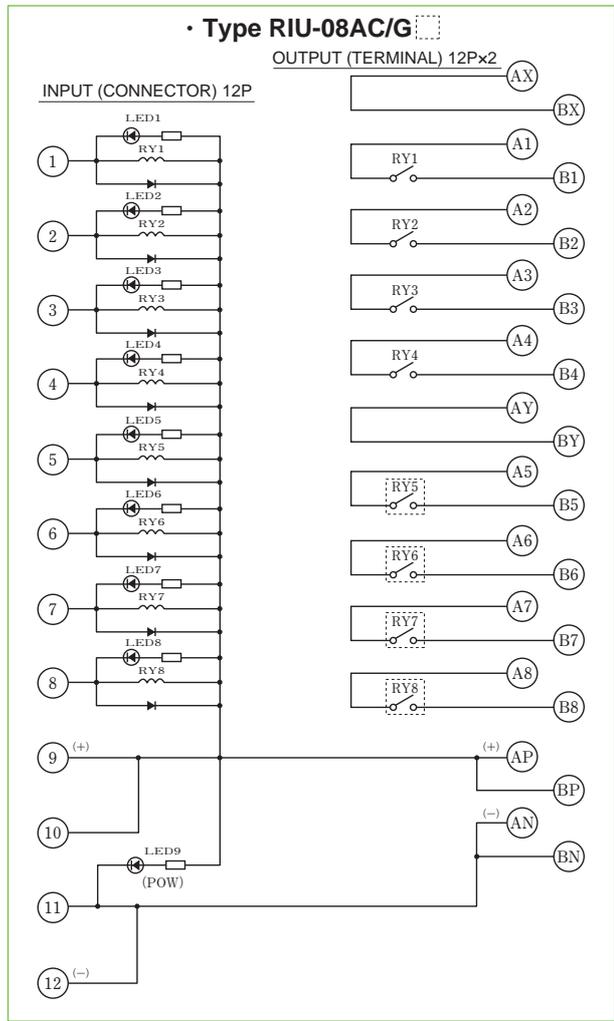
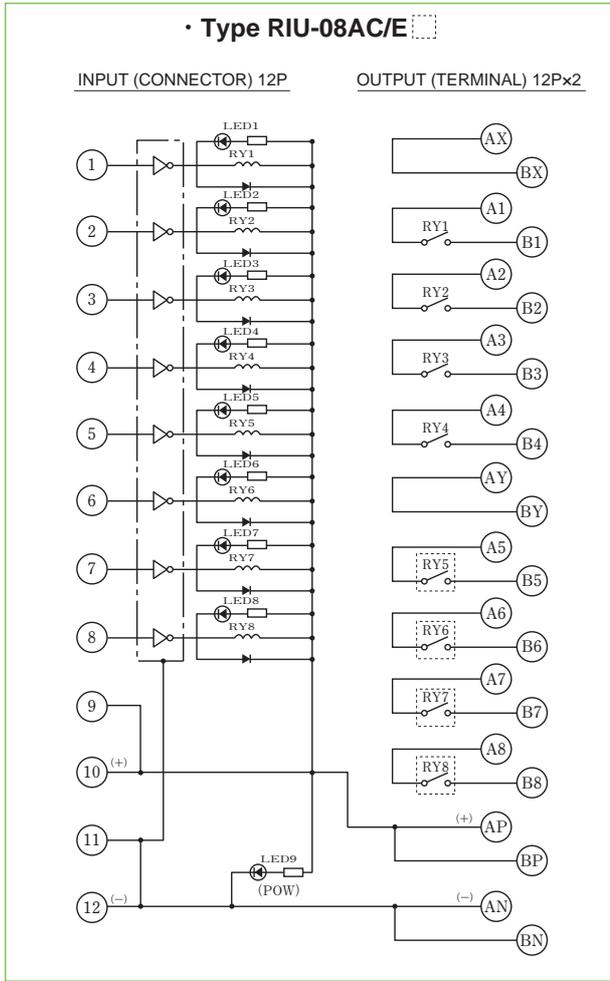


• Type RIU-04EC/G ()

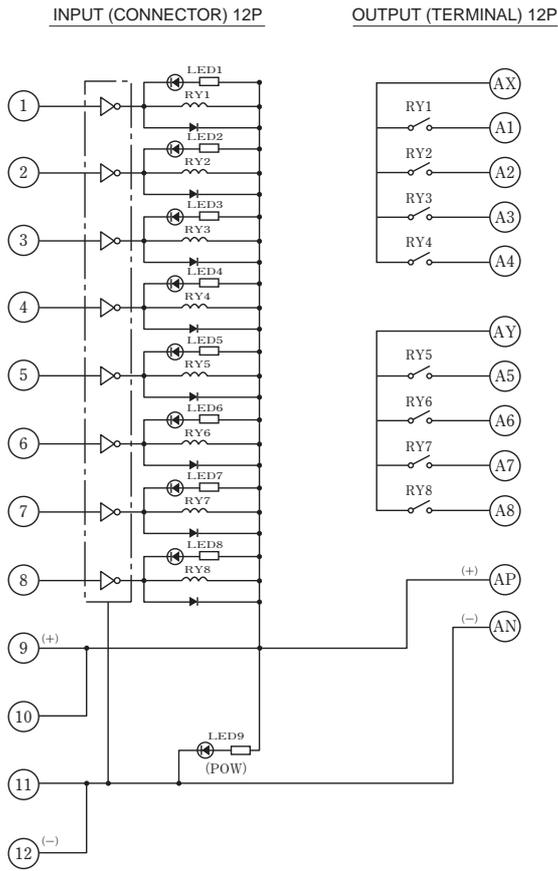


• Type RIU-10AC/G ()

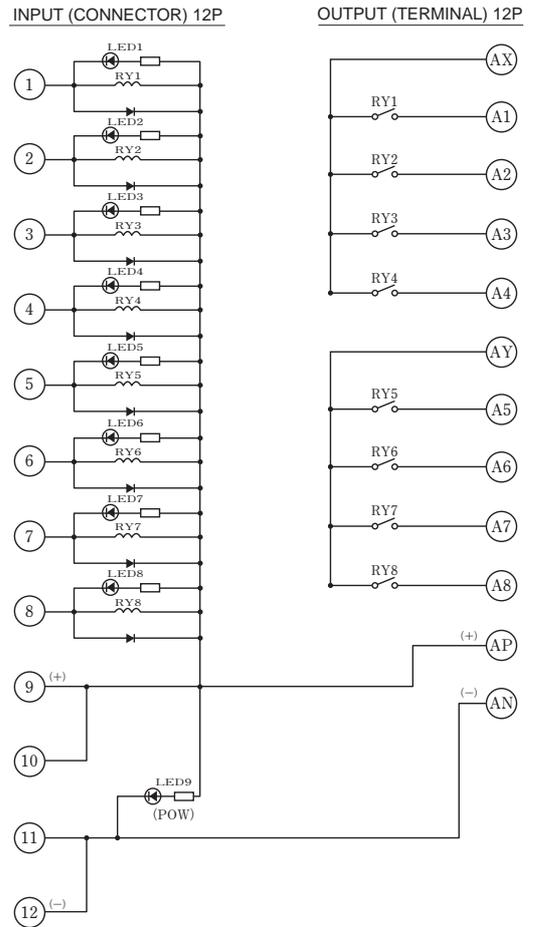




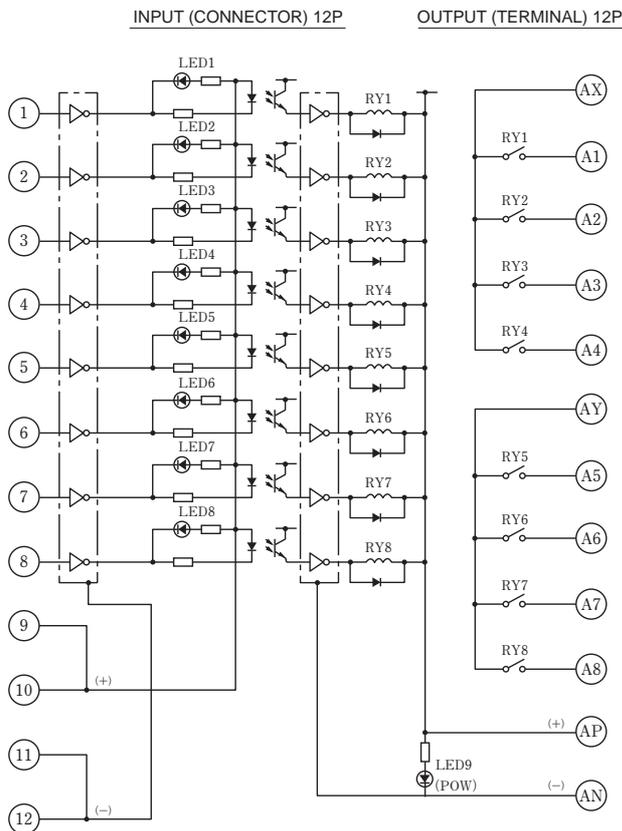
• Type RIU-08BC/E



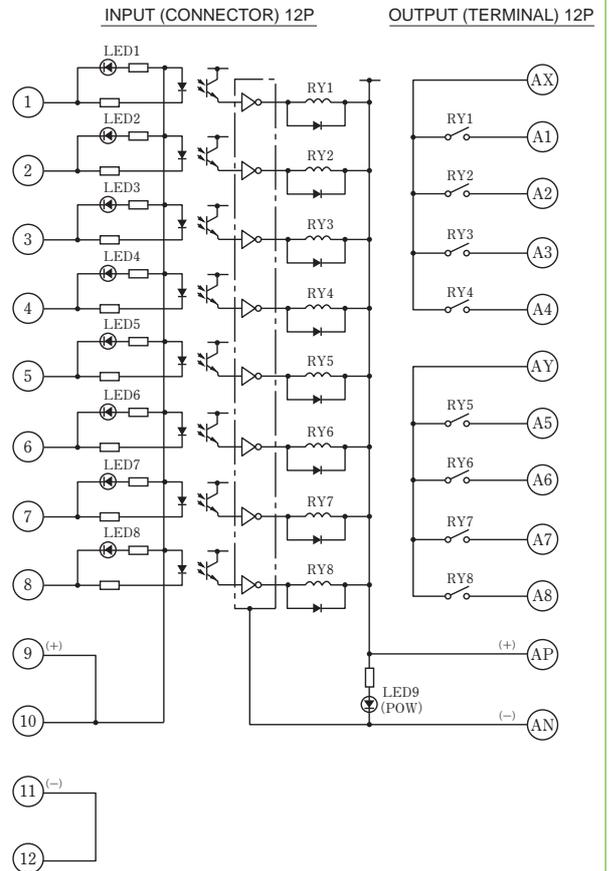
• Type RIU-08BC/G



• Type RIU-08BC/F



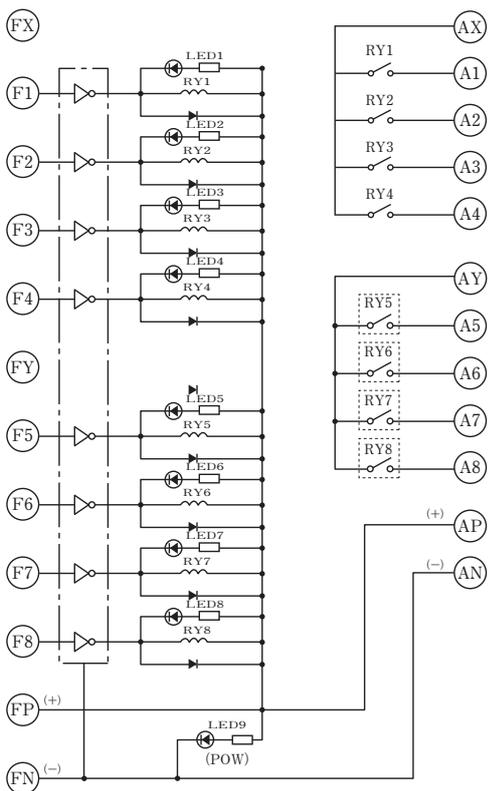
• Type RIU-08BC/H



• Type RIU-08CC/E

INPUT (TERMINAL) 12P

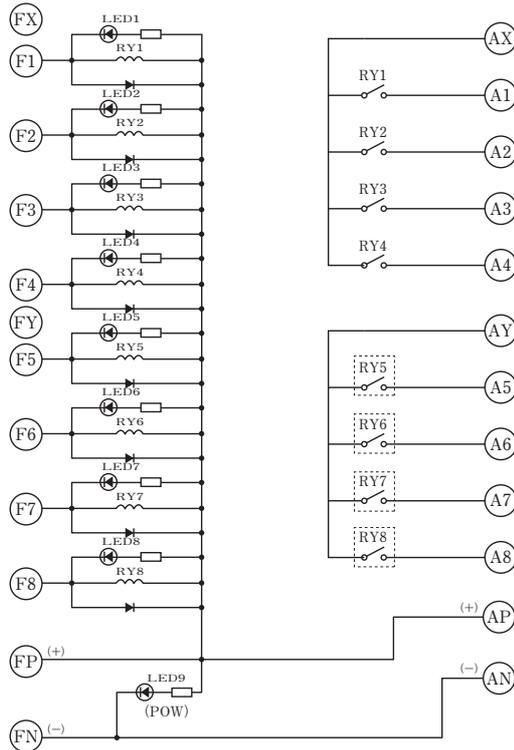
OUTPUT (TERMINAL) 12P



• Type RIU-08CC/G

INPUT (TERMINAL) 12P

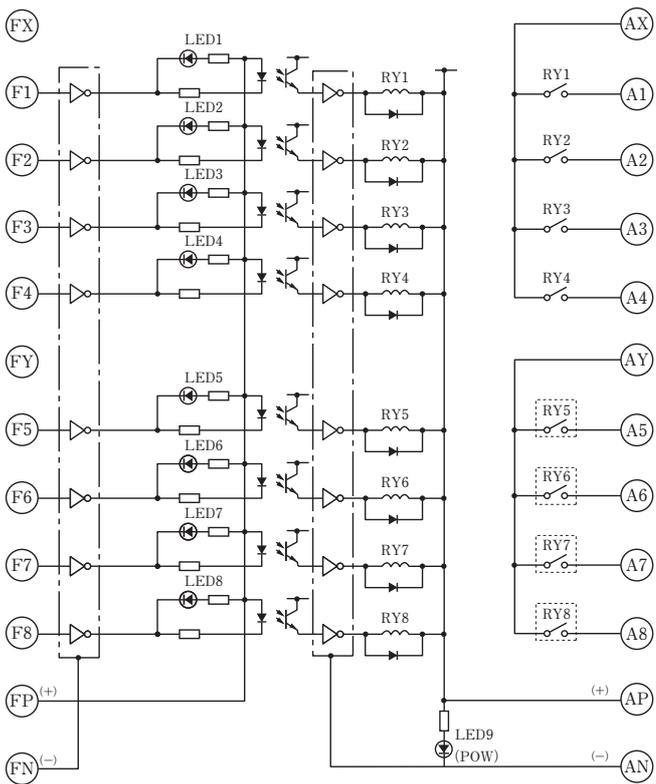
OUTPUT (TERMINAL) 12P



• Type RIU-08CC/F

INPUT (TERMINAL) 12P

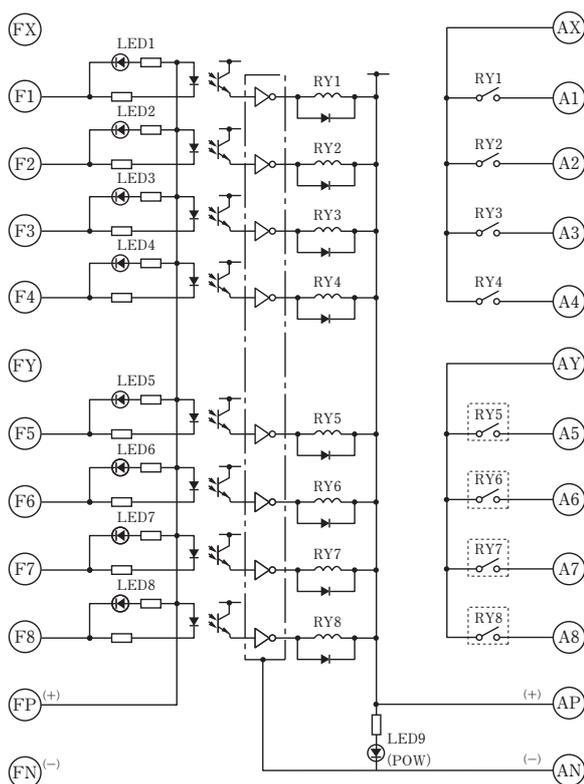
OUTPUT (TERMINAL) 12P



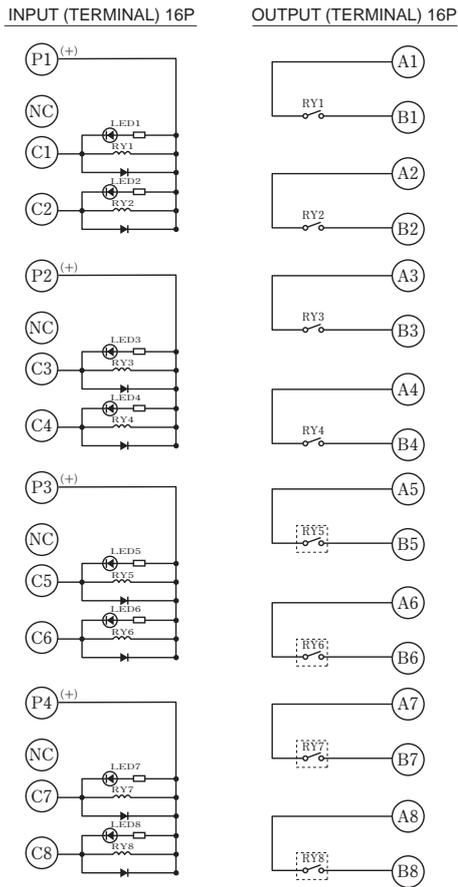
• Type RIU-08CC/H

INPUT (TERMINAL) 12P

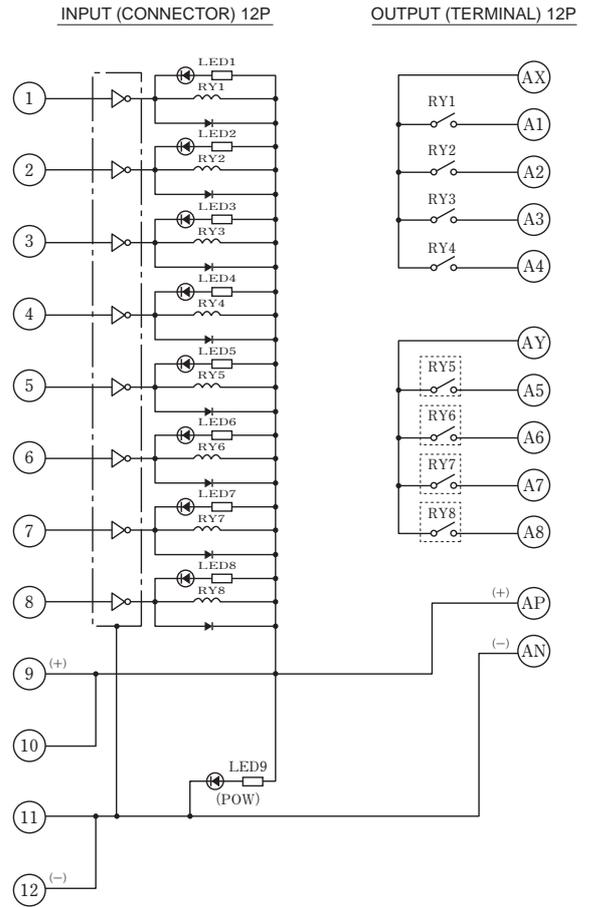
OUTPUT (TERMINAL) 12P



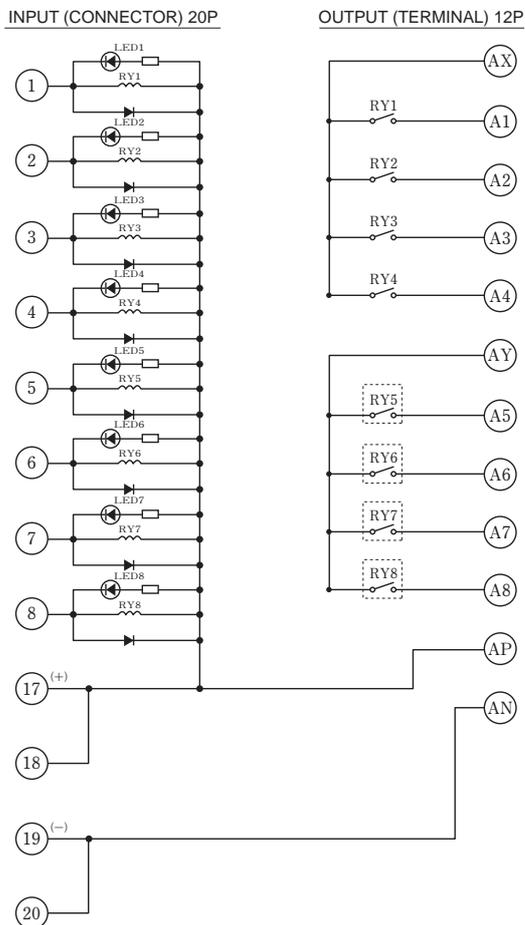
• Type RIU-08EC/G



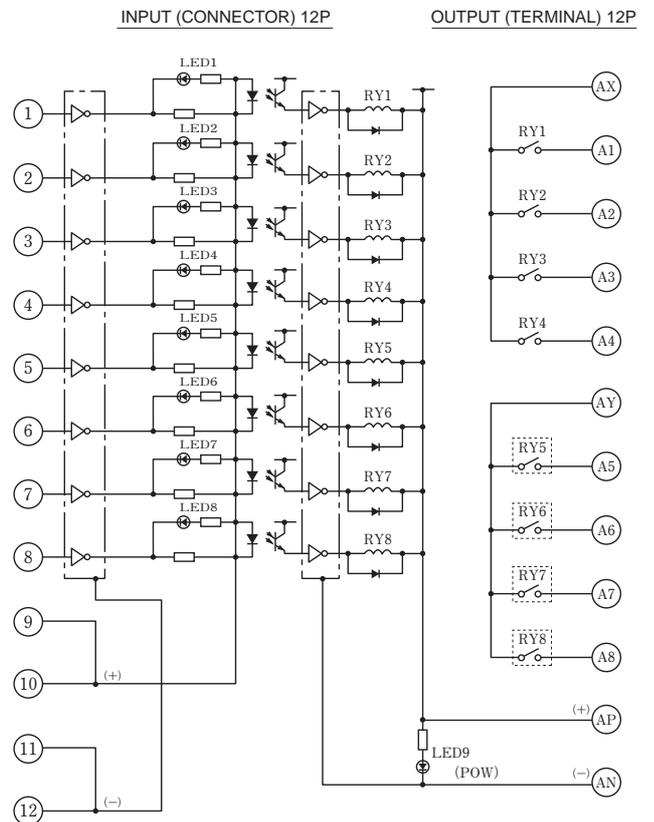
• Type RIU-08GC/E



• Type RIU-08FC/G

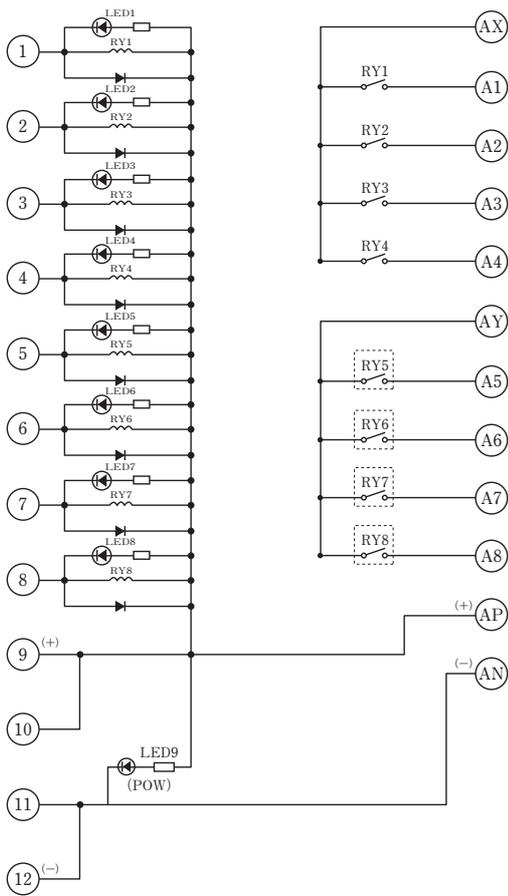


• Type RIU-08GC/F



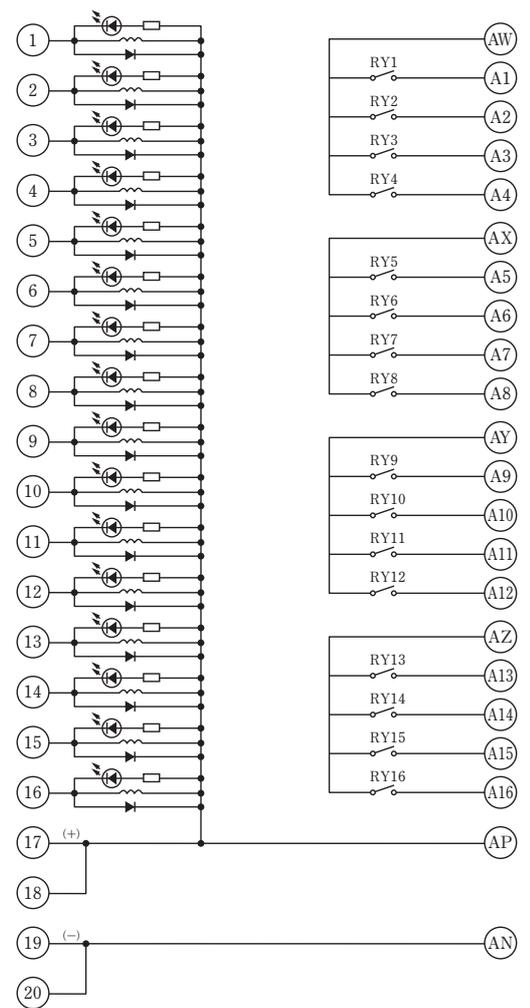
• Type RIU-08GC/G

INPUT (CONNECTOR) 12P OUTPUT (TERMINAL) 12P



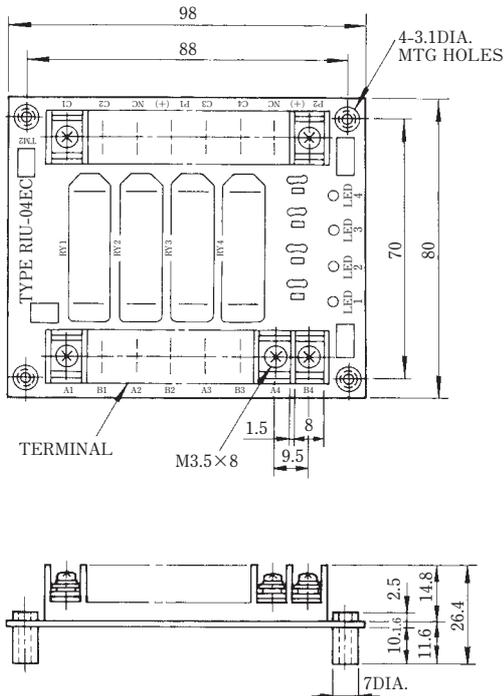
• Type RIU-16FC/G24

INPUT (CONNECTOR) 20P OUTPUT (TERMINAL) 22P

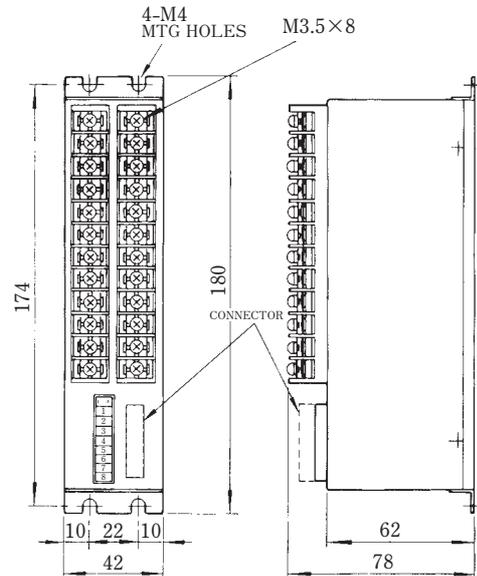


DIMENSIONS in mm

• Type RIU-04EC/G (For 4 circuits)

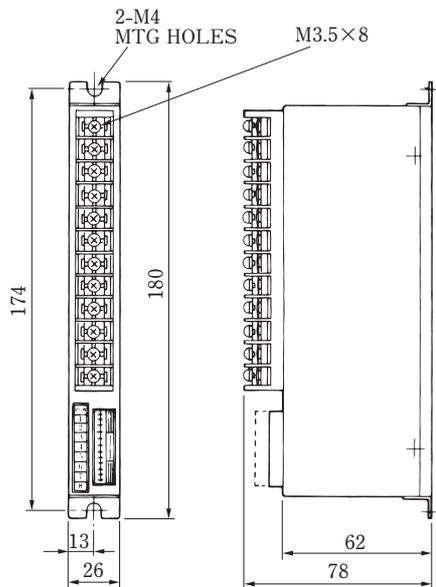


• Type RIU-08AC/ , -08CC/ (For 8 circuits)

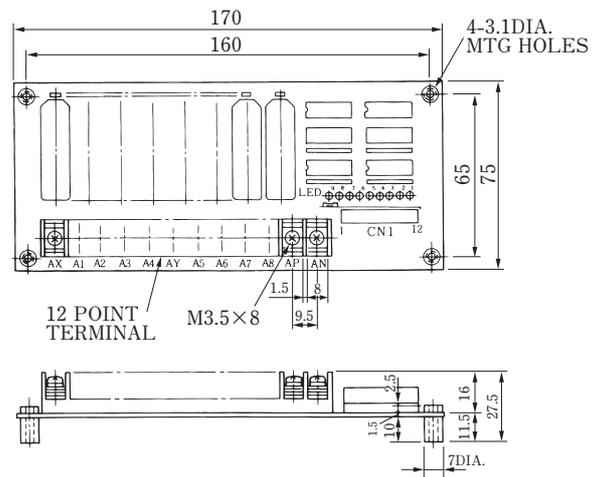


Note: Type -08CC doesn't have any connector.

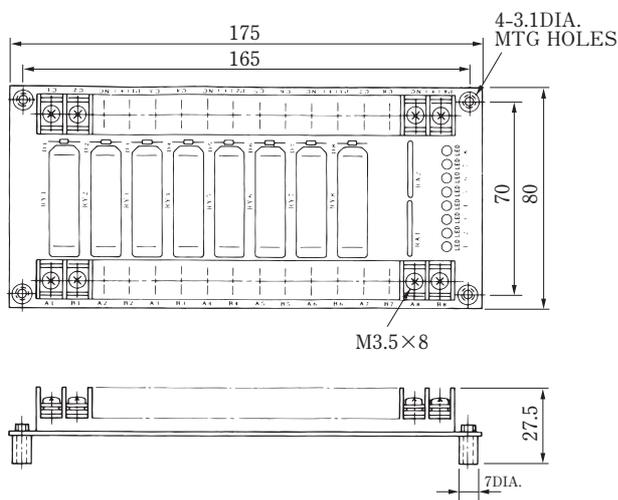
• Type RIU-08BC/ (For 8 circuits)



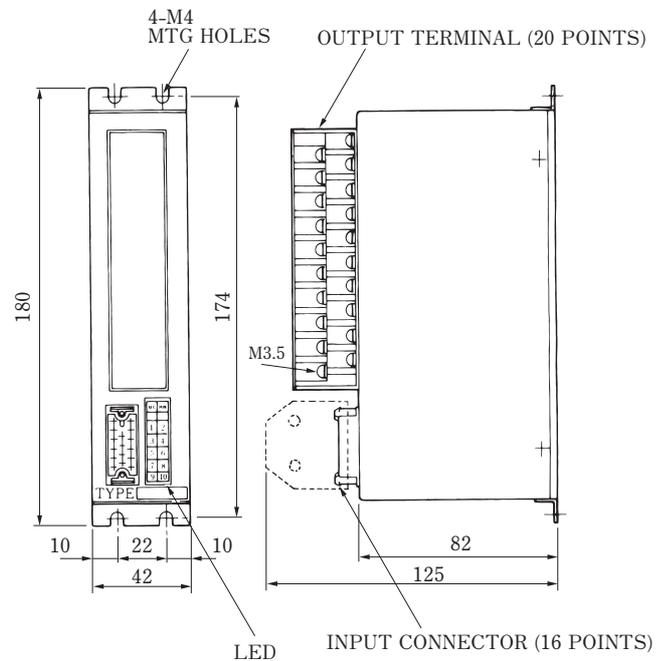
• Type RIU-08GC/ (For 8 circuits)



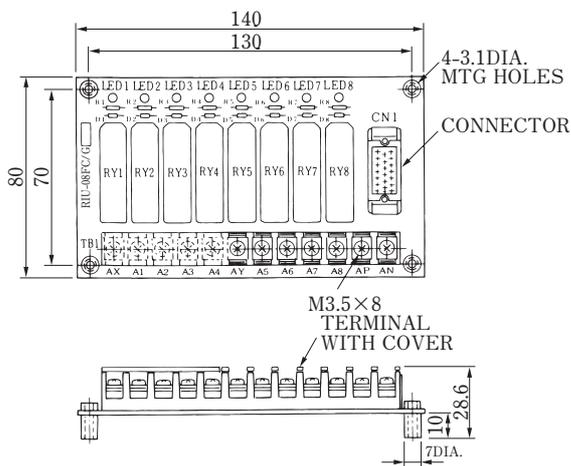
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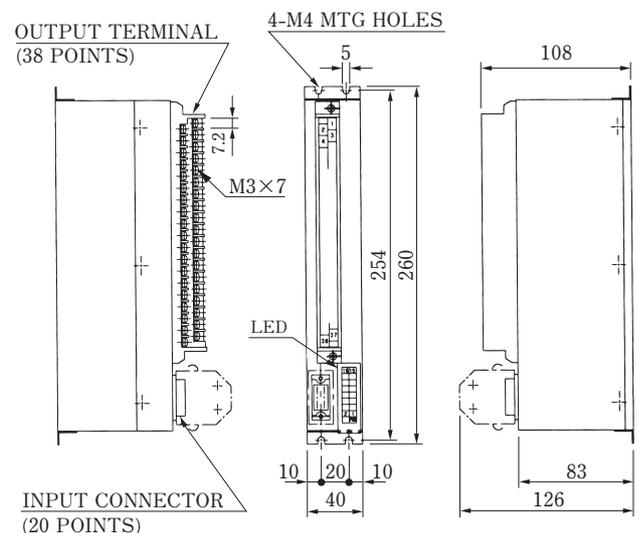
• Type RIU-10AC/ (For 10 circuits)



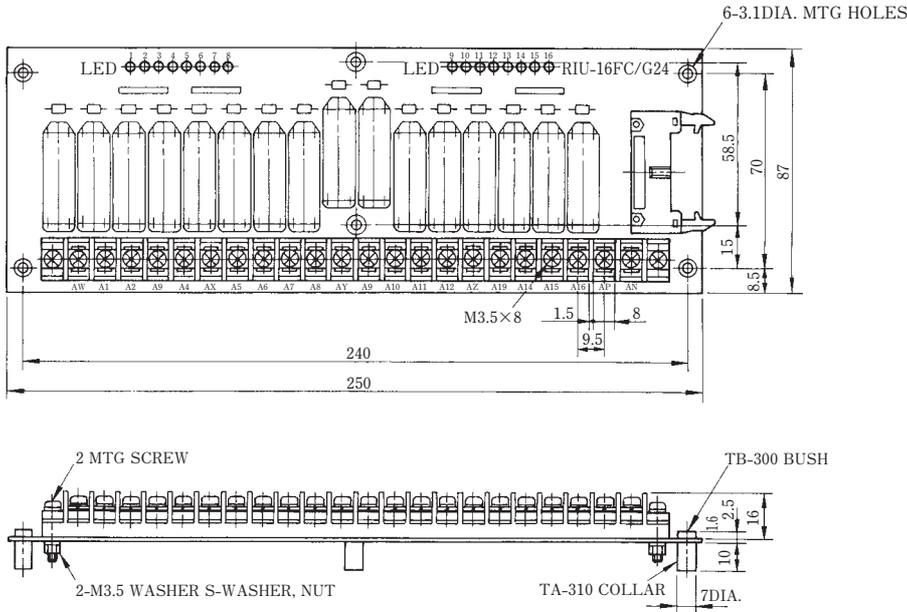
• Type RIU-08FC/ (For 8 circuits)



• Type RIU-16AC/G24 (For 16 circuits)



• Type RIU-16FC/24 (For 16 circuits)



PRECAUTIONS FOR USE

1. When wiring connector contacts of Type RIU-08AC, -08BC, -08GC, use the following tools manufactured by Japan Aviation Electronics Industry, Limited.

• Wiring

Manual type crimping tool
 Type CR150-1B-IL
 (Connector Type IL)
 (Wire size: 0.13 to 0.20mm²)

• Contact drawing

Drawing tool Type JET-IL-NO1

• Latch up

Latch up tool
 Type JLU-IL-NO1

2. Type RIU-08FC, -16AC and RIU-10AC use a soldering type connector manufactured by Honda Tsushin Kogyo Co.,Ltd.

• Type RIU-08FC, -16AC
 Connector Type MR-20LF

• Type RIU-10AC
 Connector Type MR-16LF
 Both of the connectors are attached to the products.

3. The input part of Type RIU-16FC uses an angle pin header, Type PS-20PE-D4LT manufactured by Japan Aviation Electronics industry, Limited.

• Suitable Socket Housing
 PS-D4C20 manufactured Japan Aviation Electronics Industry, Limited.
 or equivalent products.

4. When using DC circuits on the output (terminal) side, refer to the polarity table below for correct wiring. Reverse polarity wiring will cause significant reduction in contact lifetime.

Relay No.	Polarity on Output (terminal) side														signal
	Type														
	-04EC	-08BC	-08CC	-08FC	-08GC	-08AC	-08EC	-10AC	-16AC	-16FC					
	+	-	+	-	+	-	+	-	+	-	+	-	+	-	
1	B1	A1	A1	AX	B1	A1	B1	A1	0	10	2	1	A1	AW	
2	B2	A2	A2	AX	B2	A2	B2	A2	1	11	4	3	A2	AW	
3	B3	A3	A3	AX	B3	A3	B3	A3	2	12	6	5	A3	AW	
4	B4	A4	A4	AX	B4	A4	B4	A4	3	13	8	7	A4	AW	
5	-	-	A5	AY	B5	A5	B5	A5	4	14	10	9	A5	AX	
6	-	-	A6	AY	B6	A6	B6	A6	5	15	12	11	A6	AX	
7	-	-	A7	AY	B7	A7	B7	A7	6	16	14	13	A7	AX	
8	-	-	A8	AY	B8	A8	B8	A8	7	17	16	15	A8	AX	
9	-	-	-	-	-	-	-	-	8	18	18	17	A9	AY	
10	-	-	-	-	-	-	-	-	9	19	20	19	A10	AY	
11	-	-	-	-	-	-	-	-	-	22	21	21	A11	AY	
12	-	-	-	-	-	-	-	-	-	24	23	23	A12	AY	
13	-	-	-	-	-	-	-	-	-	26	25	25	A13	AZ	
14	-	-	-	-	-	-	-	-	-	28	27	27	A14	AZ	
15	-	-	-	-	-	-	-	-	-	30	29	29	A15	AZ	
16	-	-	-	-	-	-	-	-	-	32	31	31	A16	AZ	
	-	-	AP	-	AP	-	-	-	-	35	-	AP	-	+com	
	-	-	-	-	BP	-	-	-	-	-	-	-	-		
	-	-	-	-	AN	-	-	-	-	36	-	AN	-	-com	
	-	-	-	-	BN	-	-	-	-	-	-	-	-		

MULTIPOLE RELAYS

Large-capacity PCB mounted	Type RZDR-E□D1C (2-poles, 4-poles)
Medium-capacity PCB mounted	Type RZDR-G□T□C (3-poles)
Large-capacity Plug-in	Type RB-3P5□V2C (3-poles)
Medium-capacity Plug-in	Type RB□P-G□DC (3-poles, 4-poles, 6-poles)

Widely used to control various loads for railway rolling stocks and railroad signals. Providing high reliability and safety operation for railway systems. Large-capacity PCB mounted type, Medium-capacity PCB mounted type(NEW), Large-capacity Plug-in type and Medium-capacity Plug-in type (6-poles: NEW) are available. Suitable for various applications.

FEATURES

1. Extremely high performance for DC magnetic valves and solenoid loads.
2. High contact reliability, suitable for severe environments.
3. Wide range for coil input voltage corresponding to changes in rolling stock electric power.
4. Can control various loads and sequences by employing a multi-contact output.

AUXILIARY RELAYS

Type RZDR - E□D1C

Can reduce wiring and space for PCB mounted relays.

PRODUCT APPEARANCE



RATINGS AND SPECIFICATIONS

1. Coil Specifications for 4 Pole Relays

	Type	Coil Specifications*1		
		Rated Voltage	Resistance	Power Consumption
4NO	RZDR-E40D1C/D110	110VDC	4700Ω	Approx. 2.6W
	RZDR-E40D1C/D55	55VDC	1360Ω	Approx. 2.2W
	RZDR-E40D1C/D50	50VDC	1170Ω	Approx. 2.2W
	RZDR-E40D1C/D24	24VDC	310Ω	Approx. 1.9W
4NC	RZDR-E04D1C/D110	110VDC	7250Ω	Approx. 1.7W
	RZDR-E04D1C/D55	55VDC	1360Ω	Approx. 2.2W
	RZDR-E04D1C/D50	50VDC	1170Ω	Approx. 2.2W
	RZDR-E04D1C/D24	24VDC	310Ω	Approx. 1.9W

2. Coil Specifications for 2 Pole Relays

	Type	Coil Specifications*1		
		Rated Voltage	Resistance	Power Consumption
2NO	RZDR-E20D1C/D110	110VDC	7620Ω	Approx. 1.6W
	RZDR-E20D1C/D55	55VDC	1760Ω	Approx. 1.4W
	RZDR-E20D1C/D50	50VDC	1610Ω	Approx. 1.6W
	RZDR-E20D1C/D24	24VDC	410Ω	Approx. 1.4W
2NC	RZDR-E02D1C/D110	110VDC	6940Ω	Approx. 1.7W
	RZDR-E02D1C/D55	55VDC	1760Ω	Approx. 1.4W
	RZDR-E02D1C/D50	50VDC	1610Ω	Approx. 1.6W
	RZDR-E02D1C/D24	24VDC	410Ω	Approx. 1.4W

Note: * 1. Coil resistance is the value at ambient temperature of 20°C. This value can vary ±10%.

2. Coil specification might be changed without notice. Contact Yaskawa before you order.

3. Operation Characteristics Specifications

Operation Characteristics	Conditions
Operating Voltage : 70 to 110% of Coil Ratings	Operating Temperature: -25 to +60°C
Minimum Operating Voltage : 70% or less of Coil Ratings	Operating Temperature: -25 to +60°C, Cold/Hot Start
Releasing Voltage: 10% or greater of Coil Ratings	Operating Temperature: +20°C Cold Start

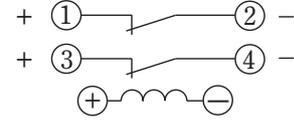
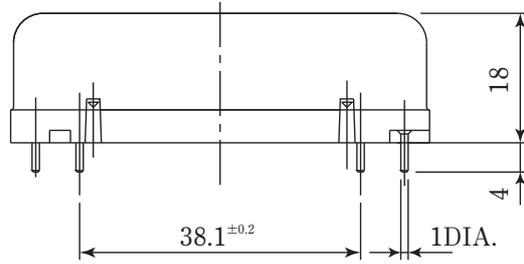
CONTACT RATINGS AND SPECIFICATIONS

Product Type		RZDR-E40D1C	RZDR-E04D1C	RZDR-E20D1C	RZDR-E02D1C
Contact Arrangement		4NO	4NC	2NO	2NC
Incorporated Bestact		R15			
Rated Insulation Voltage		250VAC (Power Frequency)			
Contact Performance		Refer to page 19.			
Operating Time Characteristics*1	Operating Time Difference of Each Contact	Approx. 1ms			
	Operating Time	NO contacts: Approx. 5ms (Bounce Time not included), NC contacts: Approx. 3ms			
	Releasing Time	NO contacts: Approx. 6ms, NC contacts: Approx. 8ms (Bounce Time not included)			
Insulation Characteristics	Insulation Resistance	100MΩ or greater (with 500VDC Megger)			
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute, (Across Open Contacts: 800VAC)			
Vibration and Shock Characteristics	Vibration Resistance	IEC 61373 Category 1Class B			
	Shock Resistance	IEC 61373 Category 1Class B			
Ambient Temperature (With no freezing or condensation)	Operating	-25 to +60°C			
	Storage	-40 to +80°C			
Approx. Weight		130g		60g	

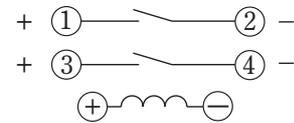
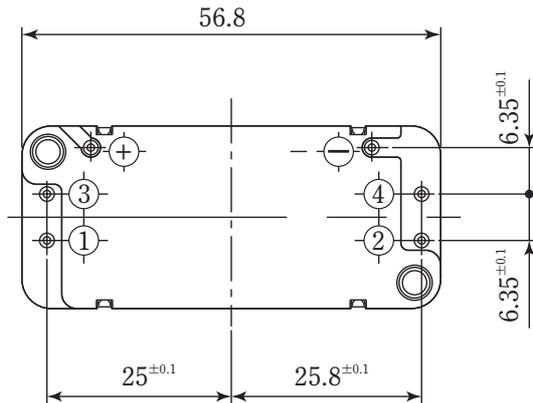
Note: * 1. Operating time characteristics are the values when coil ratings voltage is applied at ambient temperature of 20°C.

DIMENSIONS in mm

Type RZDR-E20D1C



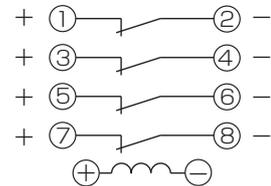
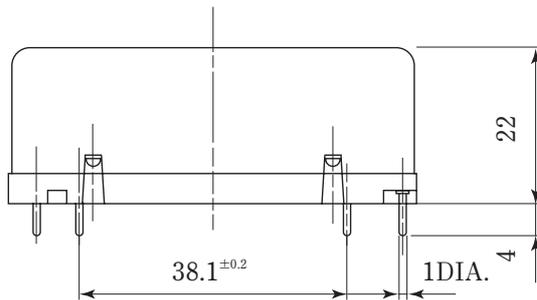
Type RZDR-E20D1C



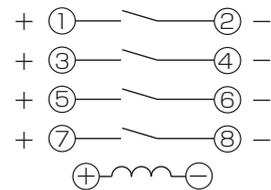
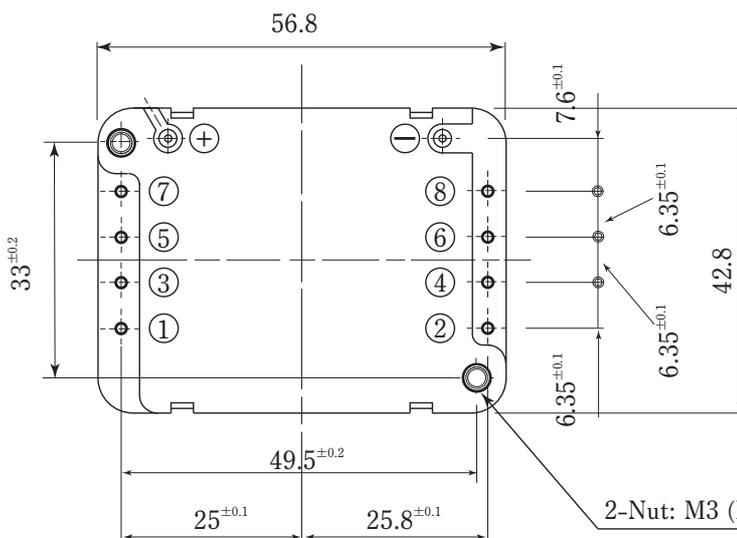
Type RZDR-E20D1C

Terminal Markings and Contact Arrangement (Top View)

Type RZDR-E40D1C



Type RZDR-E40D1C



Type RZDR-E40D1C

Terminal Markings and Contact Arrangement (Top View)

PRECAUTIONS FOR USE

- Follow the above polarity when using coils and contacts.
- Refer to (3), (4), (5), (7), (8), CAUTION and RESTRICTION on page 23.

RATINGS AND SPECIFICATIONS

• Coil Specification of relay

Contact Arrangement	Type	Coil Specification*1		
		Rated Voltage	Resistance	Power Consumption
3NO	RZDR-G30DT RC/D110	110VDC	7200Ω	Approx. 1.7W
2NO1NC	RZDR-G21DT RC/D110			
1NO2NC	RZDR-G12DT RC/D110			
3NC	RZDR-G03DT RC/D110			
3NO	RZDR-G30DT RC/D100	100VDC	5850Ω	Approx. 1.7W
2NO1NC	RZDR-G21DT RC/D100			
1NO2NC	RZDR-G12DT RC/D100			
3NC	RZDR-G03DT RC/D100			
3NO	RZDR-G30DT RC/D72	72VDC	3525Ω	Approx. 1.5W
2NO1NC	RZDR-G21DT RC/D72			
1NO2NC	RZDR-G12DT RC/D72			
3NC	RZDR-G03DT RC/D72			
3NO	RZDR-G30DT RC/D55	55VDC	1890Ω	Approx. 1.6W
2NO1NC	RZDR-G21DT RC/D55			
1NO2NC	RZDR-G12DT RC/D55			
3NC	RZDR-G03DT RC/D55			
3NO	RZDR-G30DT RC/D50	50VDC	1530Ω	Approx. 1.6W
2NO1NC	RZDR-G21DT RC/D50			
1NO2NC	RZDR-G12DT RC/D50			
3NC	RZDR-G03DT RC/D50			
3NO	RZDR-G30DT RC/D36	36VDC	750Ω	Approx. 1.7W
2NO1NC	RZDR-G21DT RC/D36			
1NO2NC	RZDR-G12DT RC/D36			
3NC	RZDR-G03DT RC/D36			
3NO	RZDR-G30DT C/D24	24VDC	360Ω	Approx. 1.6W
2NO1NC	RZDR-G21DT C/D24			
1NO2NC	RZDR-G12DT C/D24			
3NC	RZDR-G03DT C/D24			
3NO	RZDR-G30DT C/D12	12VDC	105Ω	Approx. 1.4W
2NO1NC	RZDR-G21DT C/D12			
1NO2NC	RZDR-G12DT C/D12			
3NC	RZDR-G03DT C/D12			

Note: * 1. Coil specifications tabulated are the values at ambient temperature of 20°C. This value can vary ±10%.

• Operation Characteristics Specifications (RZDR-G DT RC/D)

Operation Characteristics	Conditions
Operating Voltage: 70 to 125% of Coil Ratings *1	Operating Temperature:-40 to +70°C (In case of T1) -25 to +70°C (In case of T2)
Minimum Operating Voltage: 70% or less of Coil Ratings	Operating Temperature:-40 to +70°C, Cold/Hot Start (In case of T1) -25 to +70°C, Cold/Hot Start (In case of T2)
Releasing Voltage: 10% or greater of Coil Ratings	Operating Temperature:+20°C Cold Start

Note: * 1. It can increase by 140% when operating time is within 1 second.

• Operation Characteristics Specifications (RZDR-G DT SC/D)

Operation Characteristics	Conditions
Operating Voltage: 90 to 110% of Coil Ratings *1	Operating Temperature:-40 to +70°C (In case of T1) -25 to +70°C (In case of T2)
Minimum Operating Voltage: 90% or less of Coil Ratings	Operating Temperature:-40 to +70°C, Cold/Hot Start (In case of T1) -25 to +70°C, Cold/Hot Start (In case of T2)
Releasing Voltage: 10% or greater of Coil Ratings	Operating Temperature:+20°C Cold Start

Note: * 1. It can increase by 140% when operating time is within 1 second.

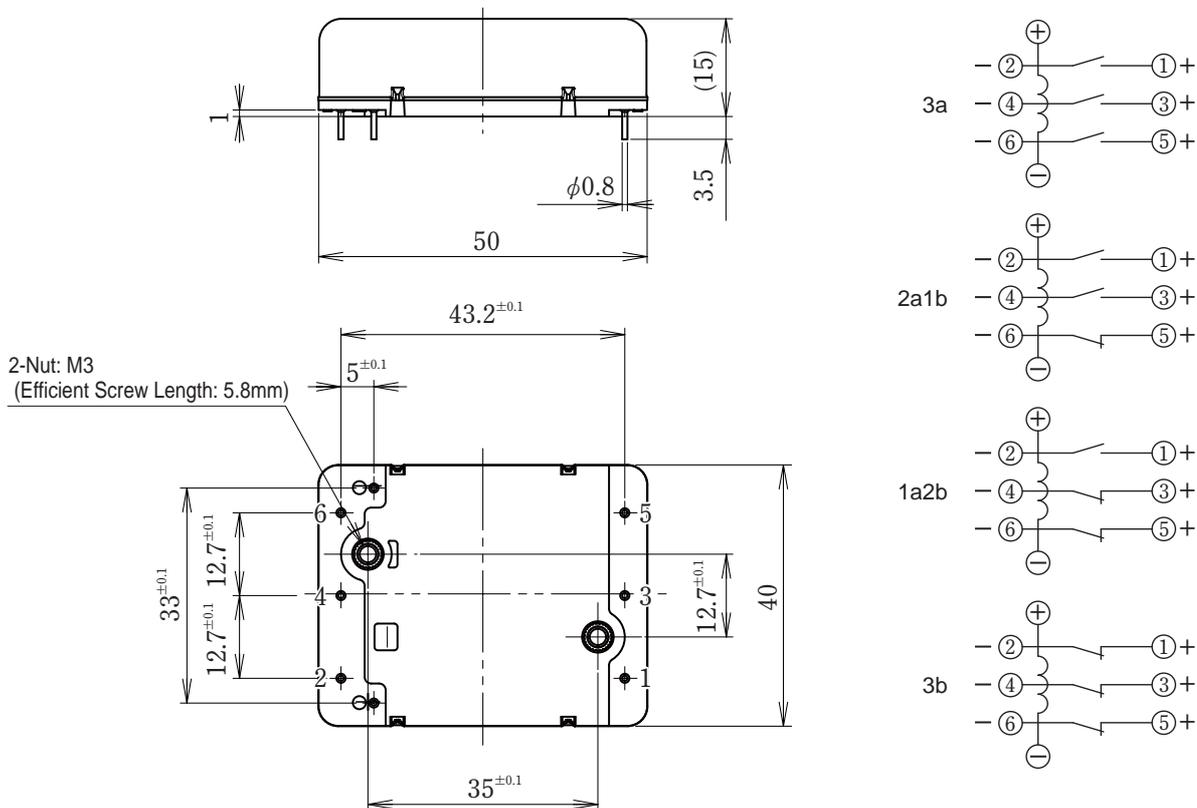
CONTACT RATINGS AND SPECIFICATIONS

Type		RZDR-G30	RZDR-G21	RZDR-G12	RZDR-G03
Contact Arrangement		3NO	2NO1NC	1NO2NC	3NC
Incorporated Bestact		R25			
Rated Insulation Voltage		250VAC (Power Frequency : 50/60Hz)			
Rated Impulse Withstand Voltage		2500V (1.2/50 μ s)			
Contact Performance		Refer to page 19.			
Operating Time Characteristics ^{*1}	Operating Time	5ms or less (Bounce Time not Included)			
	Releasing Time	5ms or less (Bounce Time not Included)			
	Bounce Time	3ms or less			
Insulation Characteristics	Insulation Resistance	Input-Output, Across Reed Switches : 100M Ω or greater (with 500VDC Megger) Across Open Contacts : 100M Ω or greater (with 500VDC Megger)			
	Withstand Voltage (Power frequency : 50/60Hz)	1500VAC for 1 minute (Across Open Contacts:500VAC)			
Vibration Resistance		IEC 61373 Category 1Class B			
Shock Resistance		IEC 61373 Category 1Class B			
Ambient Temperature (With no freezing or condensation)	Operating	T1 : -25 to +70 $^{\circ}$ C T2 : -40 to +70 $^{\circ}$ C			
	Storage	-40 to +85 $^{\circ}$ C			
Approx. Weight		75g			

Note: * 1. Operating time characteristics are the values when coil ratings voltage is applied at ambient temperature of 20 $^{\circ}$ C.

DIMENSIONS in mm

Symbols and terminal markings (TOP VIEW)



PLUG-IN TYPE RELAYS

Large-Capacity Type RB-3P□V2C

- Plug-in type relays enable easy replacement.
- Easy circuit change and addition.
- Easy routine replacement when used frequently.



RATINGS AND SPECIFICATIONS

• Coil Specifications for Relays

Type	Contact Arrangement	Rated Voltage	Rated Power Consumption	Operating Characteristics*1		
				Voltage Variation Range	Operating Voltage	Releasing Voltage
RB-3P530V2C/D1H	3NO	100VDC	Approx.2.5W	70VDC to 110VDC	70VDC or less	5VDC or greater
RB-3P530V2C/D110		110VDC		77VDC to 121VDC	77VDC or less	5.5VDC or greater
RB-3P521V2C/D1H	2NO1NC	100VDC		70VDC to 110VDC	70VDC or less	5VDC or greater
RB-3P521V2C/D110		110VDC		77VDC to 121VDC	77VDC or less	5.5VDC or greater

Note: *1. Operating characteristics are at the condition including hot start of coils at ambient temperature of -25 to $+55^{\circ}\text{C}$

CONTACT RATINGS AND SPECIFICATIONS

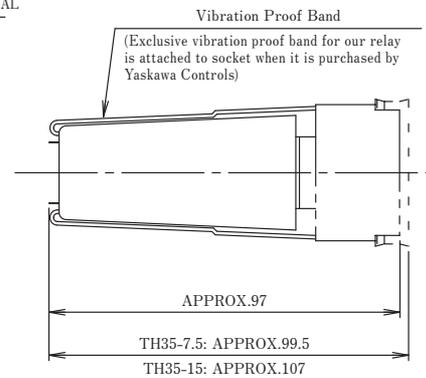
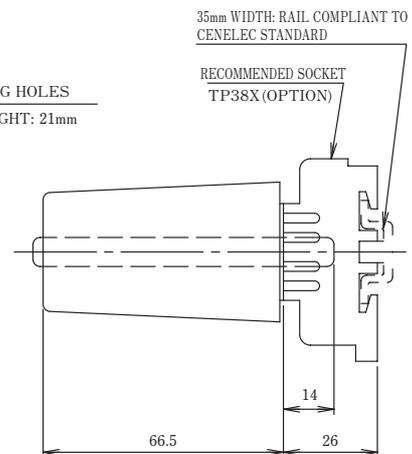
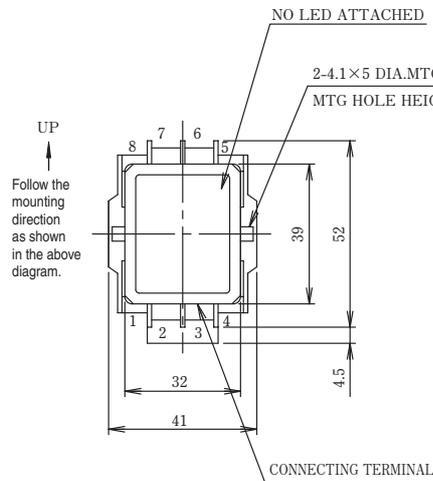
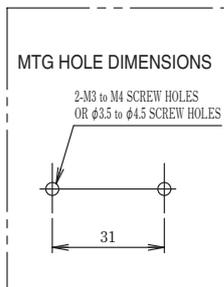
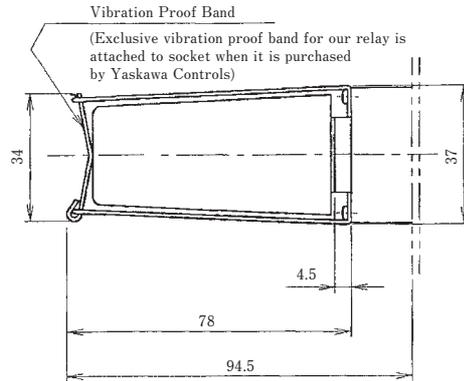
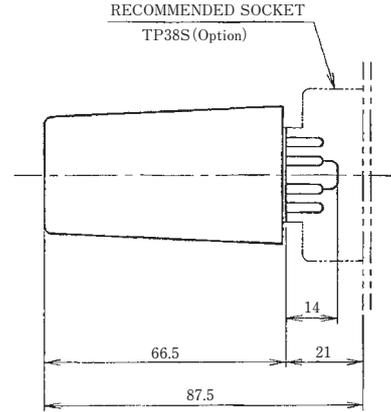
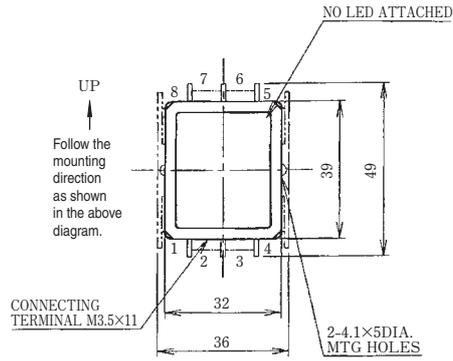
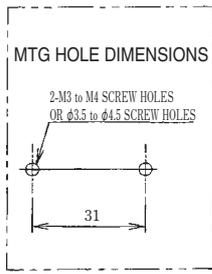
Type	RB-3P530V2C/D1H	RB-3P521V2C/D1H
Contact Arrangement	3NO	2NO1NC
Incorporated Bestact	R15	
Rated Insulation Voltage	250VAC (Power Frequency)	
Contact Performance	Refer to page 19.	
Time Characteristics*1	Operating Time	40ms or less (Bounce Time not included)
	Releasing Time	40ms or less
Insulation Characteristics	Insulation Resistance	100M Ω or greater (with 500VDC Megger)
	Withstand Voltage (Power Frequency)	2000VAC for 1 minute (Across Open Contacts: 800VAC)
Vibration Resistance*2	44.1m/s ² {4.5G} (10 to 55Hz)	
Shock Resistance*2	Erroneous Operation	147m/s ² {15G}
	Breakdown	490m/s ² {50G}
Ambient Temperature (With no freezing or condensation)	Operating	-25 to $+55^{\circ}\text{C}$
	Storage	-25 to $+75^{\circ}\text{C}$

Note: *1. Time characteristics are the values when coil ratings voltage is applied at ambient temperature of 20°C .

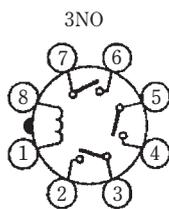
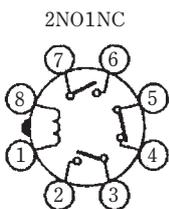
*2. Values of vibration/shock resistance are obtained when Bestact is equipped with a vibration proof band.

*3. Temperature characteristics are the values at the condition without condensation.

DIMENSIONS in mm



Symbols and terminal markings



- Note:
1. Mount a vibration proof band to protect relays from vibration and shock during transportation.
 2. Mount a vibration proof band to a socket with screws for socket mounting.
 3. When mounting relays in parallel, provide a mounting interval of 39mm or greater in case of TP38S and 42mm or greater in case of TP38X.
 4. When relays are used in a DC circuit, connect terminal number 2, 4 and 6 to ⊕ and number 3, 5 and 7 to ⊖.
 5. Follow the correct mounting direction as shown in the above diagram to protect relays from vibration and shock.

PLUG-IN TYPE MULTIPOLE RELAYS Medium-Capacity Type RB3P-G□DC



RATINGS AND SPECIFICATIONS

• Coil Specifications for Relays

Type		Coil Specifications (+20°C)	
2NO1NC	3NO	Rated Voltage	Power Consumption
RB3P-G21DC/D110	RB3P-G30DC/D110	110VDC	Approx. 1.3W
RB3P-G21DC/D1H	RB3P-G30DC/D1H	100VDC	Approx. 1.9W
RB3P-G21DC/D50	RB3P-G30DC/D50	50VDC	Approx. 2.5W
RB3P-G21DC/D26	RB3P-G30DC/D26	26VDC	Approx. 1.7W
RB3P-G21DC/D24	RB3P-G30DC/D24	24VDC	Approx. 2.5W
RB3P-G21DC/D12	RB3P-G30DC/D12	12VDC	Approx. 1.9W

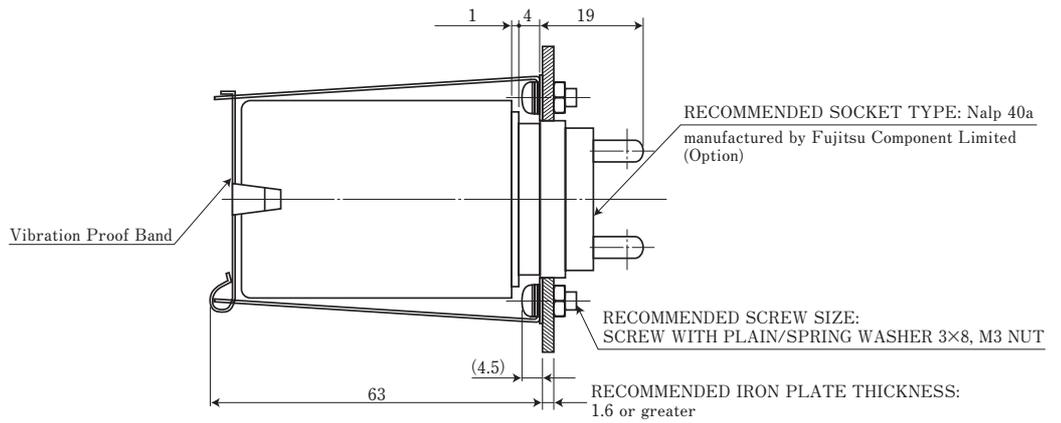
• Operation Characteristics Specifications

Operation Characteristics	Conditions
Operating Voltage : 70 to 110% of Coil Ratings	Operating Temperature:-25 to +60°C
Minimum Operating Voltage : 70% or less of Coil Ratings	Operating Temperature:-25 to +60°C, Cold/Hot Start
Releasing Voltage: 10% or greater of Coil Ratings	Operating Temperature:+20°C Cold Start

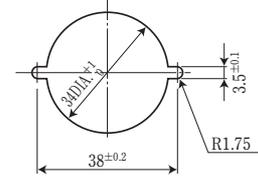
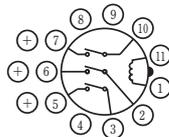
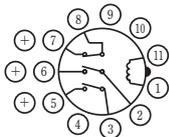
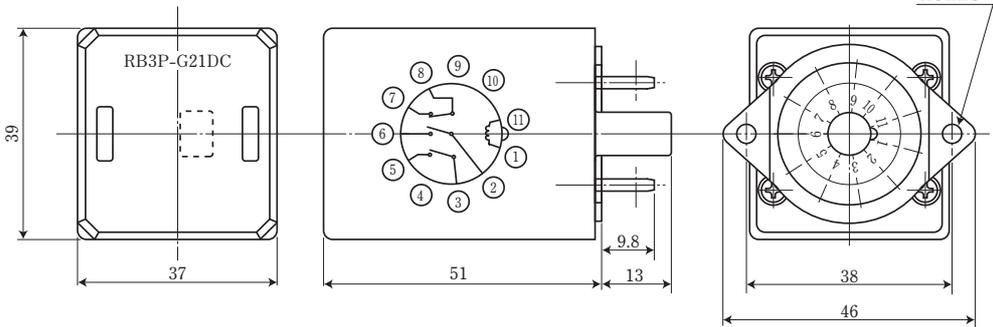
CONTACT RATINGS AND SPECIFICATIONS

Type		RB3P-G21DC	RB3P-G30DC
Contact Arrangement		2NO1NC	3NO
Rated Insulation Voltage		250VAC (Power Frequency)	
Incorporated Bestact		R25	
Rated Continuous Current		2A	
Contact Performance		Refer to page 19.	
Operating Time Characteristics	Operating Time	NO contact: Approx. 7ms, NC contact: Approx. 10ms	
	Releasing Time	NO contact: Approx. 16ms, NC contact: Approx. 10ms	
Insulation Characteristics	Insulation Resistance	100M Ω or greater (with 500VAC Megger)	
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)	
Vibration Characteristics		IEC 61373 Category 1Class B	
Shock Characteristics		IEC 61373 Category 1Class B	
Ambient Temperature (With no freezing or condensation)	Operating	-25 to +60°C	
	Storage	-40 to +60°C	
Enclosure		Almost equivalent to IP50	
Approx. Weight		110g	
Connecting Method		Recommended Socket Type: Nalp 40a	

DIMENSIONS in mm



UP
↑
Follow the mounting direction as shown in the above diagram.



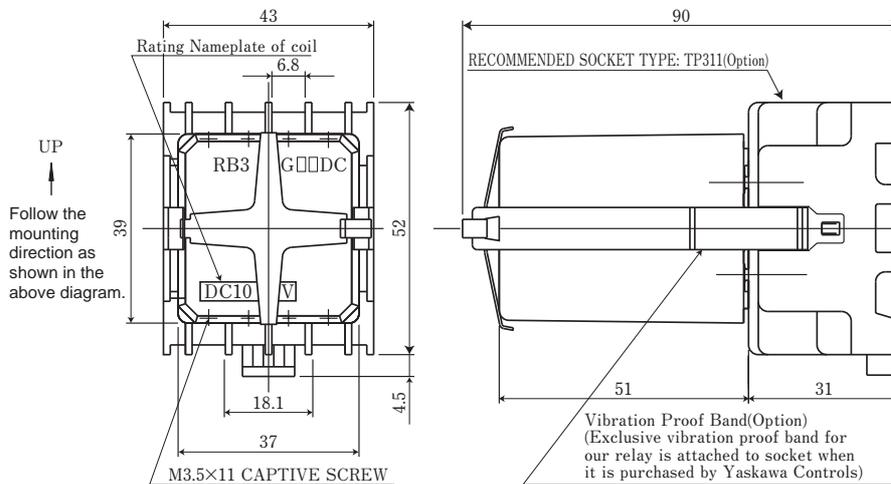
Symbols and terminal markings (BOTTOM VIEW)

- When used in a DC circuits, connect terminal No.5, 6 and 7 to \oplus .
- Coils don't have polarity designation.

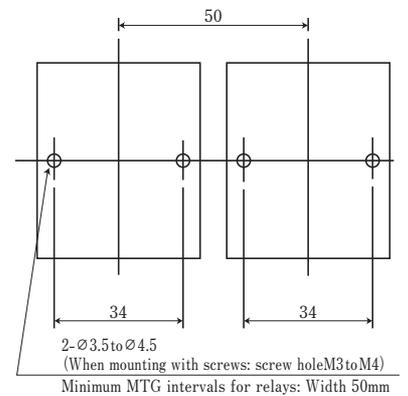
Panel diagram (Mounted from panel surface)

Minimum MTG intervals for relays: 50mm×45mm

Note: Vibration proof bands are available as option.



Hole Making Panel diagram



PLUG-IN TYPE MULTIPOLE RELAYS Medium-Capacity Type RB4P-G□DC



RATINGS AND SPECIFICATIONS

1. Coil Specifications for Relays

Type		Coil Specifications (+20°C)	
2NO2NC	4NO	Rated Voltage	Power Consumption
RB4P-G22DC/D24	RB4P-G40DC/D24	24VDC	Approx. 2.5W
RB4P-G22DC/D50	RB4P-G40DC/D50	50VDC	Approx. 2.5W
RB4P-G22DC/D1H	RB4P-G40DC/D1H	100VDC	Approx. 1.9W

Note: 1. Coil specifications tabulated are the values at ambient temperature of 20°C.

2. Operation Characteristics Specifications

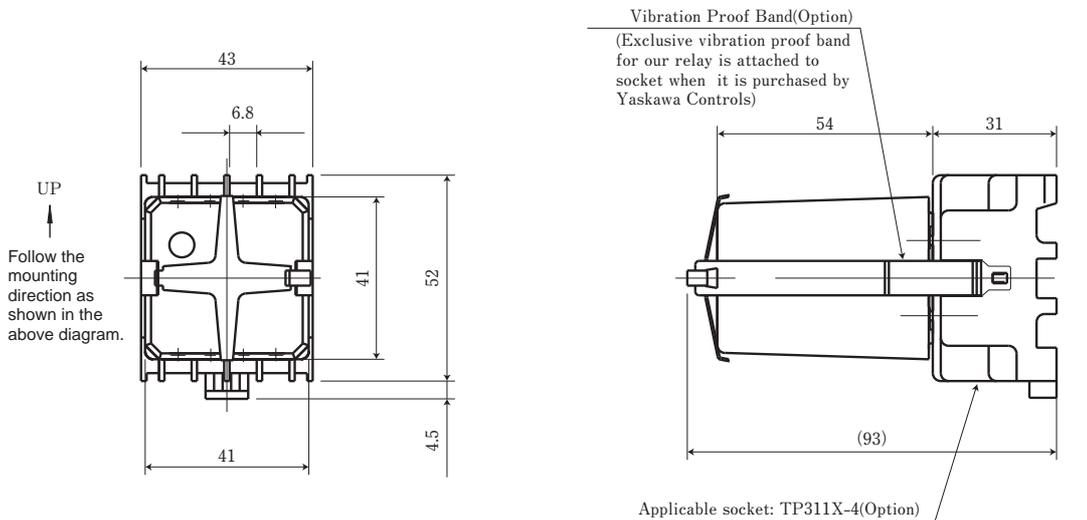
Operation Characteristics	Conditions
Operating Voltage : 70 to 110% of Coil Ratings	Operating Temperature:-25 to +60°C
Minimum Operating Voltage : 70% or less of Coil Ratings	Operating Temperature:-25 to +60°C, Cold/Hot Start
Releasing Voltage: 10% or greater of Coil Ratings	Operating Temperature:+20°C Cold Start

CONTACT RATINGS

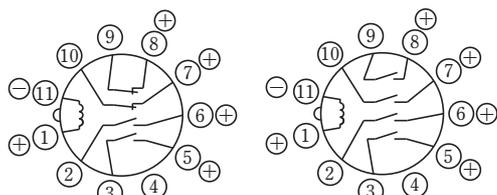
Type		RB4P-G22DC	RB4P-G40DC
Contact Arrangement		2NO2NC	4NO
Rated Insulation Voltage		250VAC (Power Frequency)	
Incorporated Bestact		R25	
Rated Continuous Current		2A	
Other Contact Performance		Refer to page 19.	
Operating Time Characteristics	Operating Time	NO contact: 20ms or less, NC contact: 20ms or less	
	Releasing Time	NO contact: 20ms or less, NC contact: 20ms or less	
Insulation Characteristics	Insulation Resistance	100MΩ or greater (with 500VDC Megger)	
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)	
Vibration Characteristics*1		IEC 61373 Category 1Class B	
Shock Characteristics*1		IEC 61373 Category 1Class B	
Ambient Temperature (With no freezing or condensation)	Operating	-25 to +60°C	
	Storage	-40 to +60°C	
Enclosure		Almost equivalent to IP50	
Approx. Weight		150g	
Connecting Method		Recommended Socket Type: TP311X-4	

Note: *1. Vibration proof band is also available. For more information, contact Yaskawa.

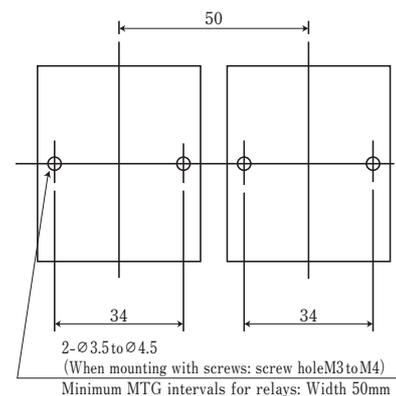
DIMENSIONS in mm



Symbols and Terminal Markings: TOP VIEW



• Use coils and contacts according to the above polarity.



PLUG-IN MULTIPOLE RELAY

Medium-Capacity Type RB6P-G□DC



FEATURES

1. Suitable for power supply(70 to 125%) in compliance with IEC standard of rolling stock.
2. Suitable for operating temperature range(-40 to 70°C) in compliance with IEC standard of rolling stock.
3. Line up all the contact arrangement(6NO, 5NO1NC, · · · 6NC) incorporating 6-poles. Available for various kinds of circuit.

RATINGS AND SPECIFICATIONS

• Coil specification of coil

Type							Coil Specifications (+20°C)	
6NO Contact Arrangement	5NO1NC Contact Arrangement	4NO2NC Contact Arrangement	3NO3NC Contact Arrangement	2NO4NC Contact Arrangement	1NO5NC Contact Arrangement	6NC Contact Arrangement	Rated Voltage	Power Consumption
RB6P-G60DC	RB6P-G51DC	RB6P-G42DC	RB6P-G33DC	RB6P-G24DC	RB6P-G15DC	RB6P-G06DC	DC110V	Approx.3.5W

• Operating Characteristics

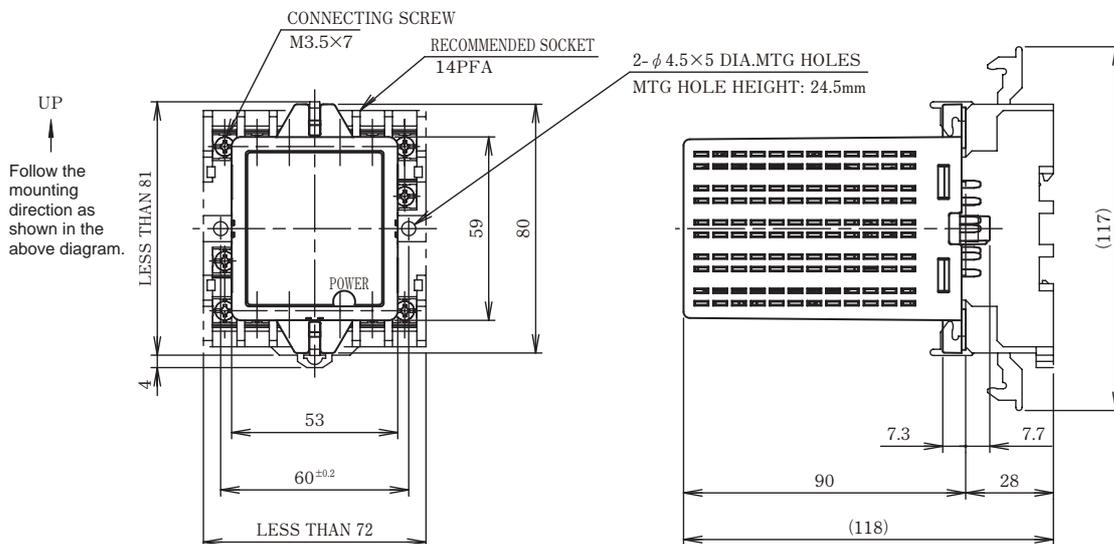
Operating Characteristics	Conditions
Operating Voltage : 70 to 125% *1 of coil rating voltage	Operating Ambient Temperature: -40 to +70°C
Minimum operating voltage : 70% or less of coil rating voltage	Operating Ambient Temperature: -40 to +70°C, Cold/Hot Start
Releasing Voltage: 10% or greater of coil rating voltage	Operating Ambient Temperature: +20°C, Cold Start

Note: * 1. Applicable up to 140% when within 0.1 sec.

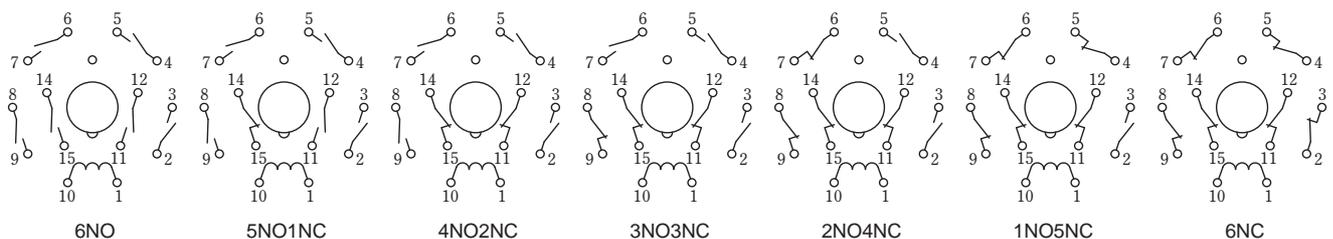
CONTACT RATINGS AND SPECIFICATIONS

Type	RB6P-G60DC	RB6P-G51DC	RB6P-G42DC	RB6P-G33DC	RB6P-G24DC	RB6P-G15DC	RB6P-G06DC
Contact Arrangement	6NO	5NO1NC	4NO2NC	3NO3NC	2NO4NC	1NO5NC	6NC
Incorporated Bestact	R25						
Rated Insulation Voltage	250VAC (Power Frequency : 50/60Hz)						
Rated Impulse Voltage	2500V (1.2/50 μ s)						
Time Characteristics	Operating Time						
	5ms or less (Bounce Time not included)						
	Releasing Time						
5ms or less (Bounce Time not included)							
Insulation Characteristics	Bounce Time						
	3ms or less						
	Insulation Resistance						
100M Ω or more (500VDC Megger)							
Withstand Voltage (Power frequency : 50/60Hz)							
1500VAC for 1 minute (Across Open Contacts : 500VAC)							
Vibration Resistance	IEC 61373 Category 1Class B						
Shock Resistance	IEC 61373 Category 1Class B						
Ambient Temperature (With no freezing or condensation)	Operating						
	-40 to +70 $^{\circ}$ C						
Enclosure	Storage						
	-40 to +85 $^{\circ}$ C						
Approx Weight	Almost equivalent to IP30						
Connecting Method	300g						
	Recommended Socket Type: 14PFA by OMRON						

DIMENSIONS in mm



Symbols and terminal markings (BOTTOM VIEW)



- Note: 1. For DC loads, connect terminals of odd number to + pole.
 2. Coils don't have polarity designation.

I/O HELPER

Medium-Capacity Type RB-2D2520C
Large-Capacity Type RB-2D520C

Covers a Wide Range of Applications from Low Level Loads to Power Loads.

Best Suited to Additional Relays for PC and Microcomputer Equipment.

FEATURES

1. Can be energized by small-capacity transistor output by integrating a flywheel diode and a LED lamp. Small power consumption of 0.7 W per circuit.
2. Directly controls a wide range of loads. Can compensate for insufficient output capacity of a general purpose PC relay.
3. Best suited for infrequent use applications by incorporating the hermetically sealed contact which has no aging. Also suited for frequent switching which is impossible with conventional contact relays.
4. Can reduce manufacturing time due to the fast operating time of 5ms or less.



TYPICAL APPLICATIONS

- Additional relays for programmable controllers
- Dry contact input for servo amplifiers, measuring instruments, etc.
- I/O interfaces for microcomputer logic
- Output relays for photoelectric switches and proximity switches.

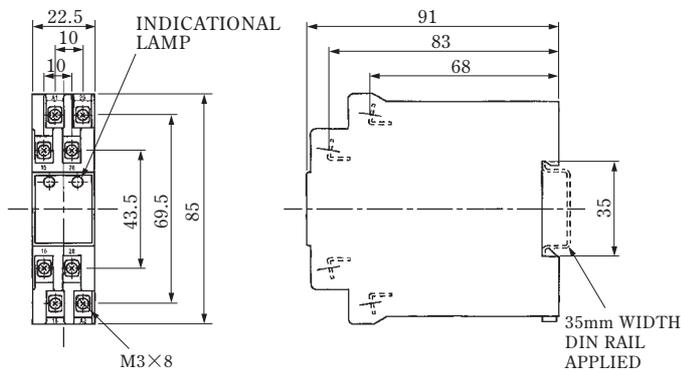
COIL SPECIFICATIONS (With polarity)

Coil Voltage	12, 24, 48 VDC
Coil Power Consumption	0.7 W × 2 Circuits (Large-capacity type) 0.6 W × 2 Circuits (Medium-capacity type)
Operating Time	5ms or less
Releasing Time	5ms or less
Ambient Temperature	-10 to +60°C

RATINGS AND SPECIFICATIONS

Type		Medium-Capacity Type	Large-Capacity Type	
		RB-2D2520C	RB-2D520C	
Incorporated Bestact		R25	R15	
Rated Insulation Voltage		250VAC (Power Frequency)	250VAC (Power Frequency)	
Contact Performance		Refer to page 19.		
Characteristics	Operating Time	5ms or less	5ms or less	
	Releasing Time	5ms or less	5ms or less	
	Vibration Resistance Erroneous Operation	98m/s ² {10G} (20 to 1000Hz)	98m/s ² {10G} (20 to 1000Hz)	
	Shock Resistance	Erroneous Operation	147m/s ² {15G}	147m/s ² {15G}
		Breakdown	980m/s ² {100G}	980m/s ² {100G}
	Insulation Resistance	100MΩ or greater (with 500VDC Megger)	100MΩ or greater (with 500VDC Megger)	
Withstand Voltage (Power Frequency)	1500VAC for 1 minute, (Across Open Contacts: 500VAC)	2000VAC for 1 minute, (Across Open Contacts: 800VAC)		
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +60°C	-10 to +60°C	
	Storage	-25 to +80°C	-25 to +80°C	
Approx. Weight		110g	150g	

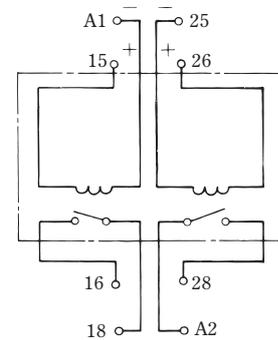
DIMENSIONS in mm



- Follow the mounting direction as shown in the above diagram.

(Same dimensions for both medium- and)
large-capacity types

CONNECTIONS



- Bestact coils have a polarity. Connect terminal number 15 and 26 to ⊕.
- For DC loads, connect terminals 16 and 28 to ⊕.

PLUG-IN RELAYS

Plug-in Type RB-3P5 LC(3-poles)
 Stationary Type RB-5ABEC (5-poles)

Best Suited for Control Relays which require High Reliability. Widely Used in Severe Operating Conditions Such as Steel Plant Equipment, Electric Power Facilities, Rolling Stock Cars and Low Level Signals.

FEATURES

1. Provides excellent performance when used for DC solenoid valves and solenoid loads.
2. Assures maximum reliability for infrequent use.
3. Direct DC control from 24V 1mA to 230VAC.
4. A hermetically sealed contact does not deteriorate even in a corrosive environment.
5. AC actuated types are also available.



TYPICAL APPLICATIONS

- Auxiliary sequence
- Emergency interlock
- For DC solenoid load control
- For adverse atmospheres
- For rolling stock cars
- For signals
- For elevators

RATINGS AND SPECIFICATIONS

Type	Type		Plug-in Type		Stationary Type
	Contact Arrangement		2NO1NC	3NO	Refer to page 55.
Incorporated Bestact	R15	RB-3P521LC	RB-3P530LC	RB-5ABEC	
Rated Insulation Voltage		250VAC (Power Frequency)		250VAC (Power Frequency)	
Contact Performance		Refer to page 19.			
Characteristics	Operating Time *1		40ms or less *2		40ms or less *2
	Releasing Time *1		40ms or less *2		40ms or less *2
	Vibration Resistance		44.1m/s ² {4.5G} (10 to 55Hz) *3		49m/s ² {5G}
	Shock Resistance	Erroneous Operation	147m/s ² {15G} *3		147m/s ² {15G}
		Breakdown	490m/s ² {50G}		490m/s ² {50G}
Insulation Resistance		100MΩ or greater (with 500VDC Megger)		100MΩ or greater (with 500VDC Megger)	
Withstand Voltage (Power Frequency)		2000VAC for 1 minute, (Across Open Contacts: 800VAC)		2000VAC for 1 minute, (Across Open Contacts: 800VAC)	
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +60°C		-10 to +60°C	
	Storage	-25 to +70°C		-25 to +70°C	
Approx. Weight		120g		430g	

Note: *1. Operating and releasing time are the values at rated voltage (20°C)

*2. Each of NO and NC contact operates independently. Therefore, the operating time of NO contact and NC contact may overlap.

*3. Values of vibration/shock resistance are obtained when Bestact is equipped with a relay retaining band. (Plug-in type).

COIL SPECIFICATIONS

• Plug-in Type RB-3P5 LC (Ambient temperature 20°C)

Rated Voltage (E) V	Rated Power Consumption	Maximum Allowable Voltage*2	Operating Characteristics	
			Minimum Operating Voltage	Release Voltage
100 (AC)	Approx. 2VA	130%E	NO contact 68%E or less	15%E or greater
200 (AC)	Approx. 2.8VA		NC contact 82%E or less	
24 (DC)	Approx. 1.9W	130%E	NO contact 72%E or less	10%E or greater
48 (DC)			NC contact 82%E or less	
100 (DC)			NC contact 82%E or less	
200 (DC)			NC contact 82%E or less	

• Stationary Type RB-5ABEC (Ambient temperature 20°C)

Rated Voltage (E) V	Rated Power Consumption	Maximum Allowable Voltage*2	Operating Characteristics	
			Minimum Operating Voltage	Release Voltage
100(AC)	Approx. 2.2 to 2.7 VA	130%E	NO contact 75%E or less	8%E or greater
200(AC)			NC contact 78%E or less	
24(DC)	Approx. 2.2W	130%E	NO contact 76%E or less	8%E or greater
48(DC)			NC contact 78%E or less	
100(DC)			NC contact 78%E or less	
200(DC)			NC contact 78%E or less	

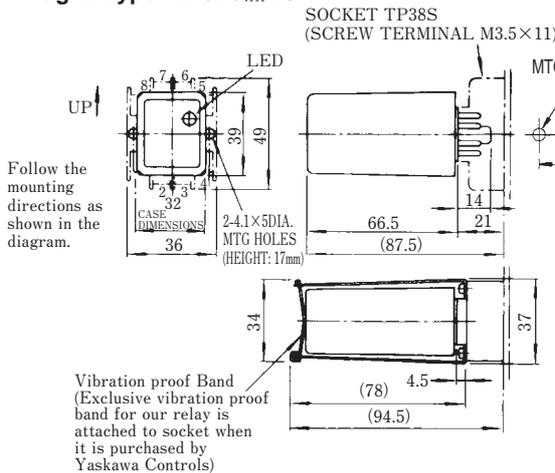
Note: 1. All the products are available as custom-order products (Plug-in type and Stationary type).

*2. Maximum allowable voltage is the maximum value that can be applied to the coil in consideration of its thermal degradation and insulators in the relays. This is not a continuous allowable voltage.

The relay incorporating NC contact may erroneously operate if the maximum allowable voltage is exceeded even for a short time.

DIMENSIONS in mm

• Plug-in Type RB-3P5 LC



Symbols and Terminal marking

2NO1NC

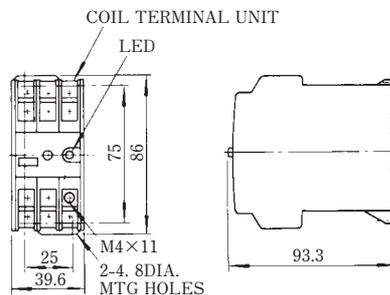


3NO



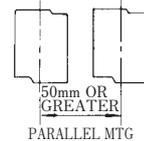
- Note: 1. When Type RB-3P5 LC and RB-5ABEC are used in a DC circuit, connect the even-numbered terminals to ⊕ and odd-numbered terminals to ⊖.
2. When mounting relays in parallel, provide a mounting interval of 42mm or greater.

• Stationary Type RB-5ABEC



Note:

- Do not change the contact arrangement. Otherwise, the operating characteristics may change.
- The unit is color-coded as follows:
Gray: NO contact unit, coil terminal units and idle unit.
Yellow: NC contact unit.
- When mounting the relays in parallel, provide a mounting interval of 50mm or greater.
- For DC loads, connect terminals of even number to + pole.



1 pole	2 poles	3 poles	4 poles	5 poles
1NO 1NC	2NO 1NO1NC 2NC	3NO 2NO1NC 1NO2NC 3NC	4NO 3NO1NC 2NO2NC 1NO3NC 4NC	5NO 3NO2NC 2NO3NC 5NC

RELAYS

Auxiliary Relays Type RI-B15T□C, -C15T1C
RI-D25T1C
Plug-in Relays Type RB-2PET□C

Mercury relays and plug-in relays have been used for trip relays in electric power breakers. However, no relay could directly control 100VDC and there were some problems such as too low current rating and potential of mercury pollution.

Bestact relays solve those problems and can be used as auxiliary relays. They are highly reliable relays provided in PCB mounted type, Plug-in type and Encased type.

FEATURES

1. High contact reliability
Highly reliable "Bestact" employing twin contacts and the wiping operation mechanism.
2. Large Contact Capacity
Large making current enables the driving of trip coils in breakers directly.
3. Quick operating time
Operating time is 5ms or less suitable for high-speed breakers.
4. Small size relays
Can reduce mounting space.

MODEL LIST

Structure	Name	Type	Contact Arrangement	Appearance	Application Example	Advantage Compared with Convention Relays
PCB Type	Auxiliary Relays	RI-B15T1C	1NO		<ul style="list-style-type: none"> • Auxiliary Relays for Electric Power • Relay for Driving Trip Coils of Electric Breakers 	<ul style="list-style-type: none"> • High Contact Reliability. • Large Contact Capacity. • Large VA Effect by the PCB Mounted type.
		RI-B15T2C				
		RI-C15T1C	1NC			
		RI-D25T1C	1NO			
Plug-in Type	Plug-in Relays	RB-2PET1C	1NO		<ul style="list-style-type: none"> • Auxiliary Relays for Electric Power 	<ul style="list-style-type: none"> • High Contact Reliability. • Reduction of Mounting Space. • Reduction of Wining.
		RB-2PET2C	1NO1NC			
		RB-2PET6C	2NO			
		RB-2PET6HC				
		RB-2PET7C	2NC			
		RB-2PET7HC				

AUXILIARY RELAYS

RI-B15T□C, -C15T1C
RI-D25T1C

RATINGS AND SPECIFICATIONS

Type		RI-B15T1C	RI-B15T2C	RI-C15T1C	RI-D25T1C	
Contact Arrangement		1NO		1NC	1NO	
Rated Insulation Voltage		250VAC (Power Frequency)			250VAC (Power Frequency)	
Contact Performance	Incorporated Bestact	R15			R25	
	Making Capacity	115VDC 20A (L/R≥5ms) Current-Carrying time: 0.5s 240VAC 30A (PF=0.7)			—	
	Breaking Capacity	115VDC 0.5A (L/R=100ms) 240VAC 1A (PF=0.4)			—	
	Other Contact Performance	Refer to page 19.				
Characteristics	Operating Time	5ms or less (20°C)	3ms (-20 to +60°C)	5ms or less (20°C)	5ms or less (20°C)	
	Releasing Time	3ms or less		7ms or less	3ms or less	
	Vibration Resistance	98m/s ² {10G} (20 to 1000Hz)			98m/s ² {10G} (20 to 1000Hz)	
	Shock Resistance	Erroneous Operation	147m/s ² {15G}			147m/s ² {15G}
		Breakdown	980m/s ² {100G}			980m/s ² {100G}
	Withstand Voltage (Power Frequency)	2200VAC for 1 minute, (Across Open Contacts: 1000VAC)			2200VAC for 1 minute, (Across Open Contacts: 500VAC)	
Insulation Resistance	100MΩ or greater (with 500VDC Megger)			100MΩ or greater (with 500VDC Megger)		
Ambient Temperature (With no freezing or condensation)	Operating	-20 to +60°C	-20 to +60°C	-40 to +60°C	-20 to +60°C	
	Storage	-40 to +80°C			-40 to +80°C	
Approx. Weight		35g		40g	15g	

Note: 1. Values tabulated above are the ones at ambient temperature of 20°C unless especially described.

COIL SPECIFICATIONS

Type	RI-B15T1C			RI-B15T2C		RI-C15T1C			RI-D25T1C			
Rated Voltage (E)	12VDC	24VDC	48VDC	12VDC	24VDC	12VDC	24VDC	48VDC	5VDC	12VDC	24VDC	48VDC
Coil Resistance* ² (Ω)	250	1020	4030	130	465	290	1080	3700	70	400	1500	5500
Rated Power Consumption (w)	0.6			1.1		0.6			0.5			
Continuous Allowable Voltage* ³	160%E 1.5W			117%E 1.5W		150%E 1.3W			170%E 1.2W			
Operating Voltage	75%E or less			75%E or less (-20 to +60°C)		75%E or less			75%E or less			
Releasing Voltage	10%E or greater			10%E or greater		10%E or greater			8.5%E or greater			

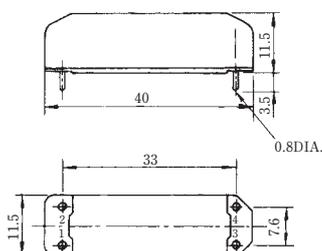
Note: 1. Coil specifications tabulated above are the ones at ambient temperature of 20°C unless especially described.

*2. Coil resistance can vary ±10%.

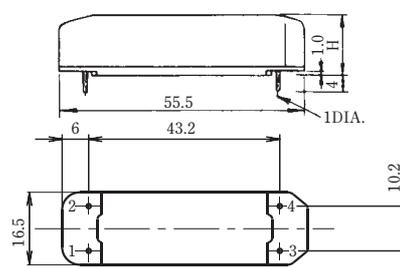
*3. Continuous allowable voltage is the value that can be applied infrequently within 3 hours. Relays incorporating NC contact may erroneously operate if the continuous allowable voltage is exceeded even for a short time.

DIMENSIONS in mm

• Type RI-D25T1C



• Type RI-B15T1C, -B15T2C, -C15T1C



Dimensions	Type	RI-B	RI-C
H		14.5	17

• Refer to NOTES FOR INSTALLATION on page 23.

Auxiliary Relays incorporating Power Reed Switch "Bestact" has a good reputation in the electric market. Our product lineup covers 2NO and 4NO output up to 110VDC coil voltage.

Conventional relays were applicable to only a narrow range because they had just one contact output.

However, our relays are suitable for wide range employing a 4 contact arrangement and can directly control logic circuits and power circuits at the same time.

FEATURES

1. High contact reliability for infrequent use.
2. Multi-contact output.
 - Applicable to a variety of use.
 - Maximum 4 outputs per 1 input.
3. Suitable for a wide range of DC load.
 - Can drive trip coils for electric breakers.
4. Space-saving
 - PCB relays can reduce mounting space and wiring.

APPEARANCE



COIL RATINGS AND SPECIFICATIONS

1. Coil specifications for 4 contact relays

Product Type	Coil Specifications*1			Operating Characteristics*2		
	Rated Voltage	Coil Resistance	Power Consumption	Continuous Allowable Voltage*3	Operating Voltage	Releasing Voltage
4NO contacts						
RZDR-E40TC/D24	24VDC	310Ω	1.9W	130%E	80%E or less	10%E or greater
RZDR-E40TC/D48	48VDC	1200Ω	1.9W	130%E	80%E or less	10%E or greater
RZDR-E40TC/D1H	110VDC	5550Ω	2.2W	130%E	80%E or less	10%E or greater

2. Coil specifications for 2 contact relays

Product Type	Coil Specifications*1			Operating Characteristics*2		
	Rated Voltage	Coil Resistance	Power Consumption	Continuous Allowable Voltage*3	Operating Voltage	Releasing Voltage
2NO contacts						
RZDR-E20TC/D24	24VDC	525Ω	1.1W	130%E	80%E or less	10%E or greater
RZDR-E20TC/D48	48VDC	1610Ω	1.4W	130%E	80%E or less	10%E or greater
RZDR-E20TC/D1H	110VDC	7400Ω	1.6W	130%E	80%E or less	10%E or greater

Note: * 1. Coil resistance can vary ±10% at ambient temperature of 20°C.

* 2. Operating voltage and releasing voltage is the values at ambient temperature of 40°C without preheating. E shows rated voltage.

* 3. Continuous allowable voltage is the value that can be applied infrequently within 3 hours.

* 4. Coil specifications might be changed. For details, contact Yaskawa.

CONTACT RATINGS AND SPECIFICATIONS

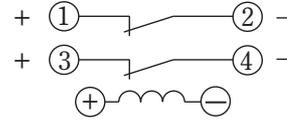
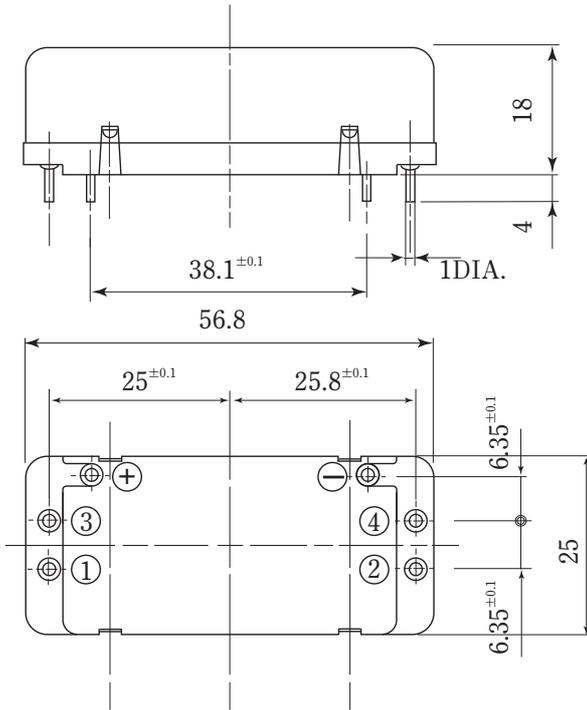
Product Type		RZDR-E40TC	RZDR-E20TC
Contact Arrangement		4NO	2NO
Incorporated Bestact		R15	
Rated Insulation Voltage		250VAC (Power Frequency)	
Contact Ratings	Making Capacity	240VAC, 30A (PF=0.7) 115VDC, 20A (L/R \geq 5ms) Over 20,000 operations energizing 0.5 sec	
	Breaking Capacity	240VAC, 1A (PF=0.4) 115VDC, 0.5A (L/R=100ms)	
	Other Contact Performance	Refer to page 19.	
Operating Time Characteristics	Operating Time Difference of Each Contact	Approx. 1ms	
	Operating Time	5ms or less (Bounce Time not included)* ¹	
	Releasing Time	3ms or less* ¹	
	Contact Bounce Time	3ms or less	
Insulation Characteristics	Insulation Resistance	100M Ω or greater (with 500VDC Megger)	
	Withstand Voltage (Power Frequency)	2200VAC for 1 minute, (Across Open Contacts:1000VAC)	
	Impulse Withstand Voltage	Across Input and Output: 1.2 \times 50 μ s 4500V	
Vibration and Shock Characteristics	Vibration Resistance	98m/s ² {10G} (20 to 1000Hz)	
	Shock Resistance	Erroneous Operation: 147m/s ² {15G} Breakdown: 980m/s ² {100G}	
Ambient Temperature (With no freezing or condensation)	Operating	-20 to +60°C	
	Storage	-40 to +80°C	
Approx. Weight		130g	60g

Note: * 1. Time characteristics are the values under the condition that rated coil voltage is applied and no flywheel diode connected at ambient temperature of 20°C.

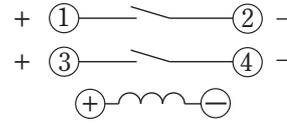
2. Contact ratings is the specifications of 1 contact.

DIMENSIONS in mm

Type RZDR-E20TC



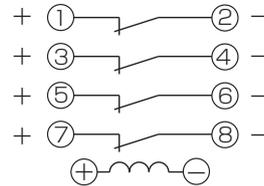
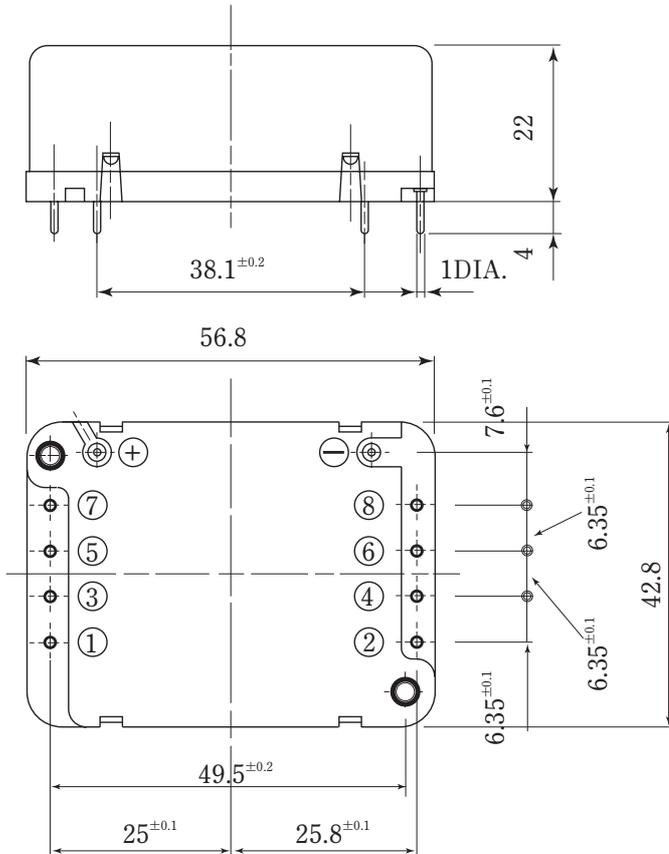
Type RZDR-E20TC



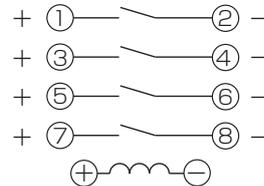
Type RZDR-E20TC

Terminal Markings and Contact Arrangement (Top View)

Type RZDR-E40TC



Type RZDR-E40TC



Type RZDR-E40TC

Terminal Markings and Contact Arrangement (Top View)

PRECAUTIONS FOR USE

- Follow the above polarity when using coils and contacts.
- Refer to (3), (4), (5), (7), (8), CAUTION and RESTRICTION on page 23.

RATINGS AND SPECIFICATIONS

Type		RB-2PET1C	RB-2PET2C	RB-2PET6C	RB-2PET6HC	RB-2PET7C	RB-2PET7HC	
Contact Arrangement		1NO	1NO1NC	2NO		2NC		
Rated Insulation Voltage		250VAC (Power Frequency)						
Contact Ratings	Incorporated Bestact	R15						
	Making Capacity	115VDC 20A (L/R≥5ms), Current-Carrying Time: 0.5s 240VAC 30A (PF=0.7)						
	Breaking Capacity	115VDC 0.5A (L/R=100ms) 240VAC 1A (PF=0.4)						
	Other Contact Performance	Refer to page 19.						
Characteristics	Operating Time	5ms or less	5ms or less	5ms or less		5ms or less		
	Releasing Time	3ms or less	NO contact: 3ms or less NC contact: 7ms or less	3ms or less		7ms or less		
	Vibration Resistance* ²	19.6m/s ² {2G} (10 to 150Hz)						
	Shock Resistance* ²	Erroneous Operation	147m/s ² {15G}					
		Breakdown	294m/s ² {30G}					
	Withstand Voltage (Power Frequency)	2200VAC for 1minute, (Across Open Contacts: 1000VAC)						
Insulation Resistance	100MΩ or greater (with 500VDC Megger)							
Ambient Temperature (With no freezing or condensation)	Operating	-20 to +60°C			-20 to +50°C	-20 to +60°C	-20 to +50°C	
	Storage	-40 to +80°C						
Approx. Weight		140g						

Note: 1. Values of ratings and specifications tabulated above are the ones at ambient temperature of 20°C.

*2. Values of vibration/shock resistance are obtained when Bestact is equipped with a relay retaining band.

COIL SPECIFICATIONS

Type	RB-2PET1C	RB-2PET2C	RB-2PET6C		RB-2PET6HC	RB-2PET7C		RB-2PET7HC
Rated Voltage (E)	12VDC	12VDC	24VDC	48VDC	110VDC	24VDC	48VDC	110VDC
Rated Current (mA)* ²	26	50	50	27	13	48	29	14
Rated Power Consumption (W)	0.35	0.7	1.3		2.5	1.2	1.4	2.7
Continuous Allowable Voltage* ³	150%E	150%E	150%E		150%E	150%E		150%E
Operating Voltage	75%E or less	75%E or less	75%E or less		65%E or less	75%E or less		68%E or less
Releasing Voltage	10%E or greater	10%E or greater	10%E or greater		8.5%E or greater	10%E or greater		8.5%E or greater

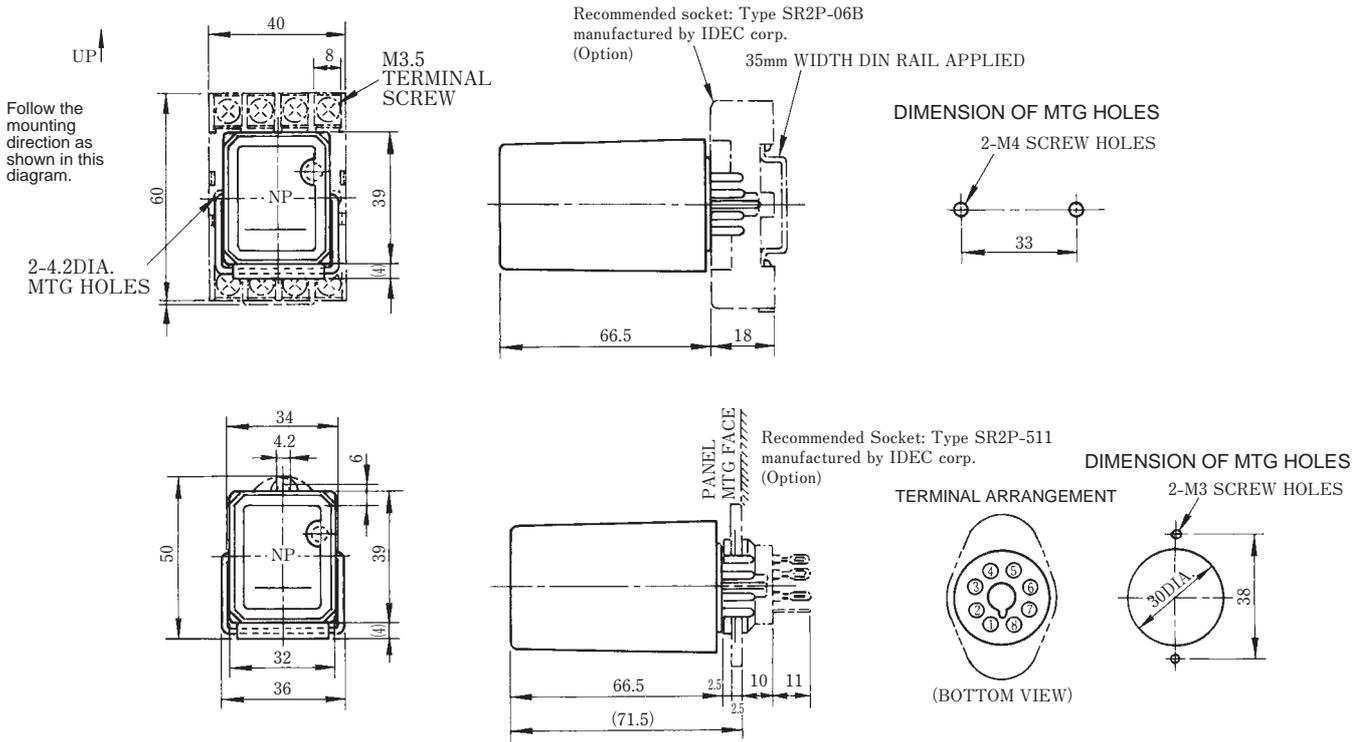
Note: 1. Coil specifications tabulated above are the ones at ambient temperature of 20°C.

*2. Coil rated current can vary ±10%.

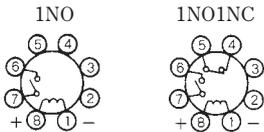
*3. Continuous allowable voltage is the value which can be applied infrequently within 3 hours. Relays incorporating NC contact may erroneously operate if the continuous allowable voltage is exceeded even for a short time.

DIMENSIONS in mm

• Type RB-2PET1C, -2PET2C

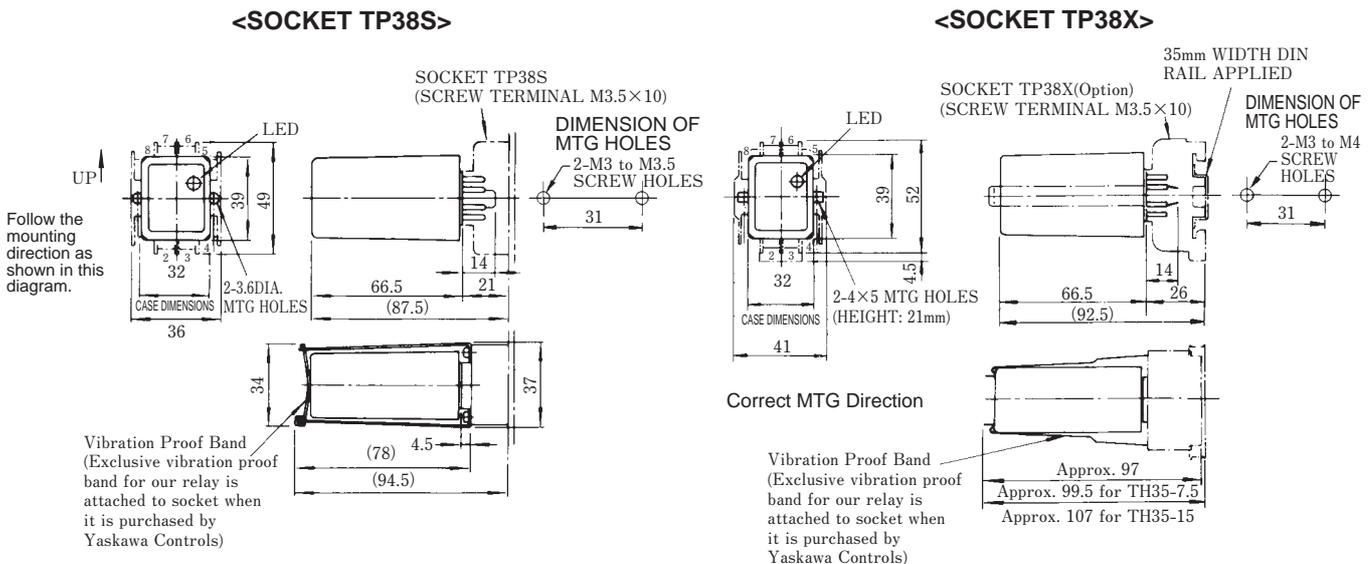


Symbols and terminal markings

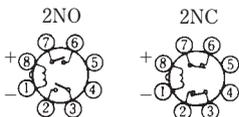


- Note:
1. Recommended socket is Type SR2P-06B (for front side) and SR2P-511 (for back side) manufactured by IDEC corp. There are some available sockets other than these, so contact other manufactures. Prepare sockets by yourself.
 2. When Type RB-2PT1C is used in a DC circuit, connect terminal No.6 to \oplus and No.7 to \ominus . When Type RB-2PT2C is used in a DC circuit, connect terminal No.4 and 6 to \oplus and No.5 and 7 to \ominus .

• Type RB-2PET6C, -2PET6HC, -2PET7C, -2PET7HC



Symbols and terminal markings



- Note: When used in a DC circuit, connect terminal No.2 and 6 to \oplus and No.3 and 7 to \ominus .

MAGNETIC PROXIMITY SWITCHES

Vane Type PSMO
 Separate Type PSMS
 Memory Type PSMM
 Column Type PSMS-RV
 MICRO SWITCH Type PPUU-G
 ROD PLUNGER Type PSPD-G
 Type PPMU-G
 Type PPMU-E

**A Wide Variety of Types Available to Meet Applications/Specifications for General Purpose, High Temperature, etc.
 The Two-Wire System Provides a Wide Power Range.**

FEATURES

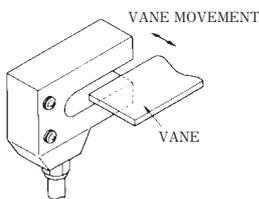
1. Completely sealed construction makes this switch best suited for adverse environments.
2. Direct control for loads of 100VDC or greater. No power supply or amplifying relay needed.
3. The contactless design assures a long service life and maintenance-free operation.
4. Economical proximity switches.



TYPES AND HOW TO USE

Magnetic proximity switches are usually classified into two types: an integrated type such as vane type and a separate type. Switch operation principle is described below.

《Vane type》

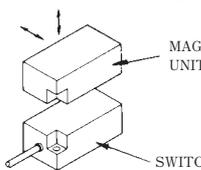


Vane type

- Vane type switches detect materials without any physical contact. Materials enter into or pass by the groove of U-shaped structure. In general, the detected materials are made of flat shape and ferromagnetic materials such as iron plates.
- The switches provide high detecting accuracy even if the detected materials have play. They have only a few constrained conditions and very easy to use.

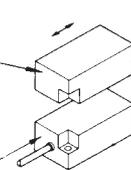
《Separate type》

MAGNET UNIT MOVEMENT



(Memory type)

MAGNET UNIT MOVEMENT



Separate type

- The switch unit is fixed, and the magnet unit is mounted on the moving object to be detected. Approach or passage of the magnet unit will be detected without contact.
- Separate type doesn't need any separately-mounted detecting unit. Moreover, one magnet unit can energize several switch units. Various detecting methods are available to match your specifications.

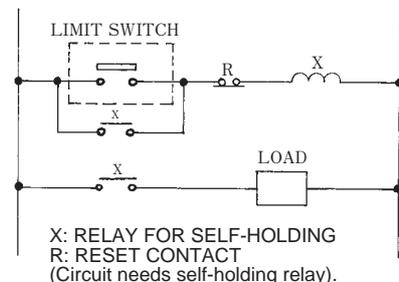
Magnet characteristics for Bestact Operation

In various detecting devices incorporating Bestact, Yaskawa selected and designed carefully the materials that energize contacts to maintain long-term high operation accuracy.

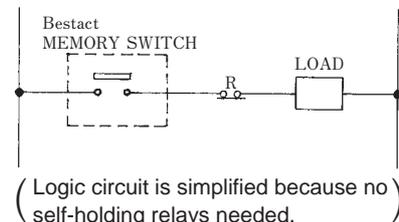
- Permanent magnets used for Yaskawa's detecting devices are rare earth magnets and anisotropic ferrite magnets which have high coercive force and large energy product. Yaskawa designed the optimum magnet shapes and the magnets are highly stable without demagnetization.
- Demagnetization due to aging is 2% or less for a 10 year period.

APPLICATION EXAMPLES

Circuit Example Using Conventional Limit Switch



Circuit Example Using Bestact Memory Type Switch



VANE TYPE MAGNETIC PROXIMITY SWITCHES

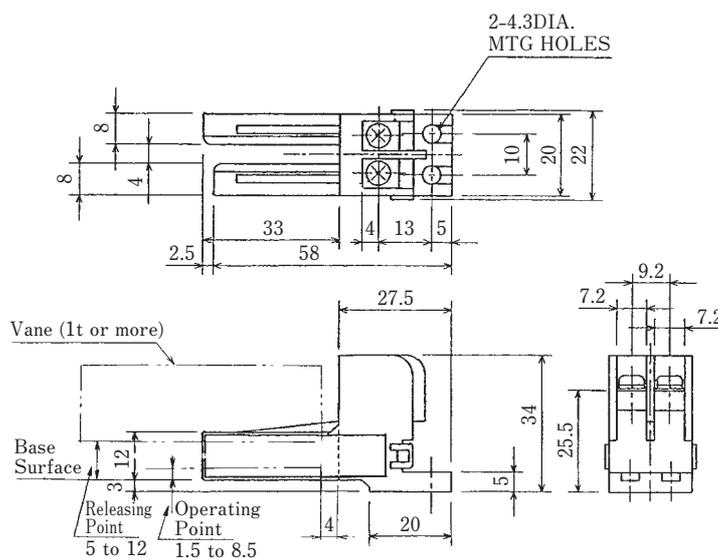
Type PSMO-04G2



RATINGS AND SPECIFICATIONS

Type		PSMO-04G2
Groove Width mm		4
Groove Depth mm		33
Contact Arrangement		1NO
Rated Insulation Voltage		250VAC (Power Frequency)
Incorporated Bestact		R25
Contact Performance		Refer to page 19.
Insulation Characteristics	Insulation Resistance	100M Ω or greater (with 500VDC Megger)
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)
Vibration Resistance		9.8m/s ² {1G}
Shock Resistance	Erroneous Operation	98m/s ² {10G}
	Breakdown	980m/s ² {100G}
Standard Vane Detected mm		t1.0 or greater
Enclosure		Almost equivalent to IP50
Connecting method		Screw Size: 3.5x8(Screw With Plain/Spring Washer)
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +50°C
	Storage	
Approx. Weight		0.3kg

DIMENSIONS in mm



Note: When switch is used in a DC circuit, connect terminal 1 to \oplus and number 2 to \ominus .

VANE TYPE MAGNETIC PROXIMITY SWITCHES

Type PSMO-25G
Type PSMO-E

High Detecting Accuracy against Unstable Moving Materials and Easy to Use

- Can control circuits of 100VDC or greater without any power supply unit or amplifying relay
- Contactless design assures long service life



RATINGS AND SPECIFICATIONS

• Medium-Capacity Type

Type		PSMO-25G1	PSMO-25G1T	PSMO-25G2	PSMO-25G2T
Groove Width mm		24			
Groove Depth mm		52			
Contact Arrangement		1NO		1NC	
Rated Insulation Voltage		250VAC (Power Frequency)			
Incorporated Bestact		R25			
Contact Performance		Refer to page 19.			
Insulation Characteristics	Insulation Resistance	5MΩ or greater (with 500VDC Megger)			
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)			
Vibration Resistance		19.6m/s ² {2G} (10 to 200Hz)			
Shock Resistance	Erroneous Operation	98m/s ² {10G}			
	Breakdown	490m/s ² {50G}			
Standard Vane Detected mm		t1.6×60×100 (t1.2 or greater)			
Enclosure *1		Almost equivalent to IP50	Almost equivalent to IP67	Almost equivalent to IP50	Almost equivalent to IP67
Connecting method (Cable)		0.75mm ² 2 conductors 2.5m long.	0.75mm ² 2 conductors 1m long.	0.75mm ² 2 conductors 2.5m long.	0.75mm ² 2 conductors 1m long.
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +50°C			
	Storage	-25 to +70°C			
Approx. Weight		0.4kg			

Note: * 1. Refer to page 92 for Degrees of Protection.

• Large-Capacity Type

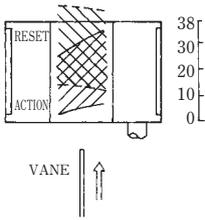
Type		PSMO-05E2 PSMO-05E2/P	PSMO-25E1 PSMO-25E1/P	PSMO-25E2 PSMO-25E2/P	PSMO-25E1T	PSMO-25E2T
Groove Width mm		5	25			
Groove Depth mm		36	52			
Contact Arrangement		1NC	1NO	1NC	1NO	1NC
Incorporated Bestact		R15				
Contact Performance		Refer to page 19.				
Rated Insulation Voltage		250VAC (Power Frequency)				
Insulation Characteristics	Insulation Resistance	5MΩ or greater (with 500VDC Megger)				
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 800VAC)				
Vibration Resistance		9.8m/s ² {1G} (10 to 55Hz)				
Shock Resistance	Erroneous Operation	98m/s ² {10G}				
	Breakdown	980m/s ² {100G}				
Standard Vane Detected mm*1		t1.6 or greater	t2.3t×60×100 or greater			
Enclosure *2		Almost equivalent to IP50			Almost equivalent to IP67	
Connecting method	Terminal Block	Screw size : M4×8			---	---
	Cable	1.25mm ² 2 conductors 1m long.			1.25mm ² 2 conductors 2m long.	
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +60°C				
	Storage	-25 to +70°C				
Approx. Weight		0.7kg	0.8kg	1.4kg		

Note: * 1. Vane size of ferromagnetic structural iron plate.

* 2. Screw terminal of type PSMO-05E2 cannot be used as waterproof type since the screw terminal is exposed.

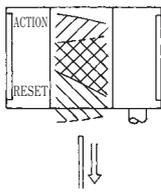
OPERATING CHARACTERISTICS

12 5 0 5 12 (mm)



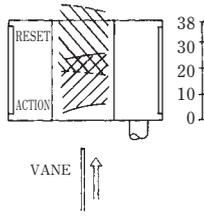
Type PSMO-25G1

12 5 0 5 12 (mm)

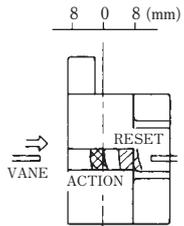
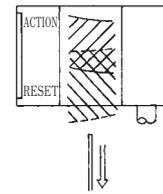


Type PSMO-25G2

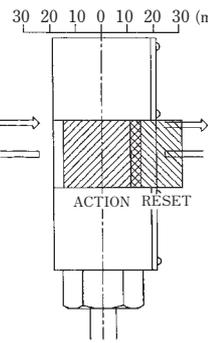
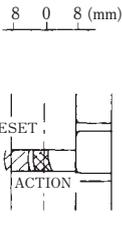
12 5 0 5 12 (mm)



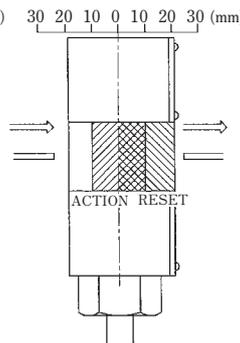
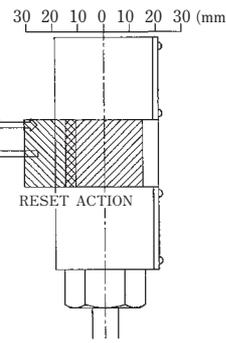
12 5 0 5 12 (mm)



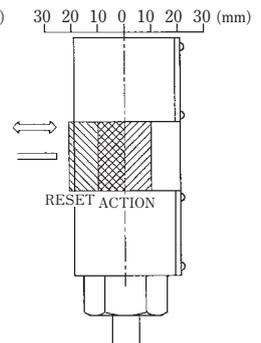
Type PSMO-05E2



Type PSMO-25E1, -25E1T, and
-25E1TH



Type PSMO-25E2, -25E2T, and
-25E2TH



- Note:
- \Rightarrow : Pass-through detection type
 - \Leftrightarrow : Type that returns to the original position after operation.
 - When a vane moves from the right, the operating characteristics are axisymmetric to the above characteristics.
 - Action and reset range shown above indicates the difference of each switch. However, this is not the difference of each operation at repetitive detections.

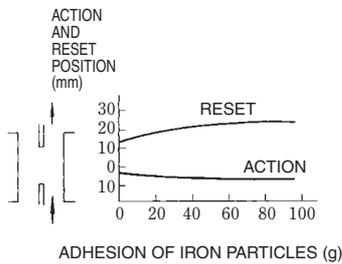
INFLUENCE BY ENVIRONMENTAL CONDITIONS

• Operating characteristics when iron particles are adhered

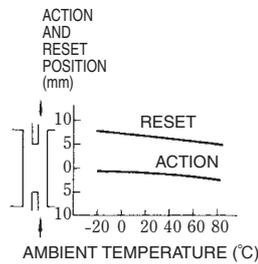
• Ambient temperature and operating characteristics



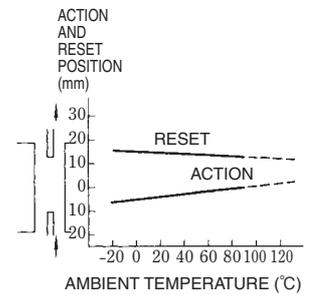
Adhesion of iron particles (60g)
(If iron particles are adhered as shown in this picture, influence is only a little bit.)



Example of Type PSMO-25E1



Type PSMO-05E2



Type PSMO-25E1, -25E1T (-25E1TH)

Easy Adjustment for Stop Levelling of Hydraulic Low-Speed Elevators.
This Product provides Adjustment-Free Operation.



RATINGS AND SPECIFICATIONS

Type		PSMO-15G1	PSMO-15G2	PSMO-15G2S	PSMO-15G1T	PSMO-15G2T
Groove Width mm		14				
Groove Depth mm		52				
Contact Arrangement		1NO	1NC		1NO	1NC
Incorporated Bestact		R25				
Contact Performance		Refer to page 19.				
Rated Insulation Voltage		250VAC (Power Frequency)				
Operating Characteristics (mm) *1	UP-ON	9 to 20	20 to 29		9 to 20	20 to 29
	UP-OFF	26 to 35	14 to 24	—	26 to 35	14 to 24
	DOWN-ON	18 to 29	9 to 18		18 to 29	9 to 18
	DOWN-OFF	3 to 12	14 to 24	—	3 to 12	14 to 24
	Response *2	12 or less		6 or less		12 or less
Insulation Characteristics	Insulation Resistance	5MΩ or greater (with 500VDC Megger)				
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)				
Vibration Resistance		19.6m/s ² {2G} (10 to 200Hz)				
Shock Resistance	Erroneous Operation	98m/s ² {10G}				
	Breakdown	490m/s ² {50G}				
Standard Vane Detected mm		t1.2×60×100 or greater				
Enclosure *3		Almost equivalent to IP50			Almost equivalent to IP67	
Connecting method (Cable)		0.75mm ² 2 conductors 1m long.				
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +50°C				
	Storage	-25 to +70°C				
Approx. Weight		0.4kg				

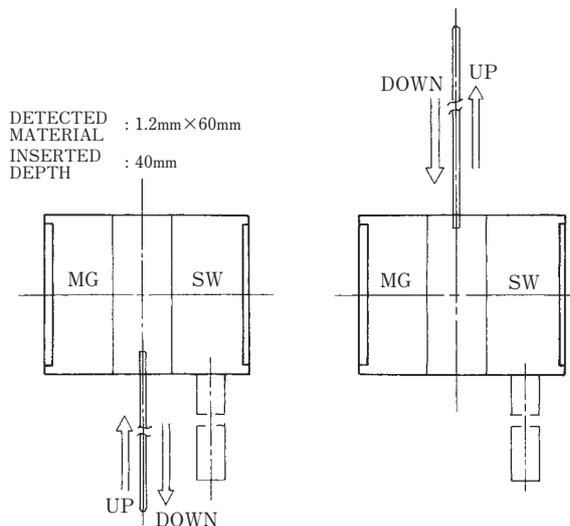
Note: * 1. Operating characteristics are nearly symmetric to vane passage direction (vertical).

Values tabulated are the ones at insertion depth of 40mm.

* 2. Response shows the difference between the operating point and releasing point (absolute value) as shown in figure below.

(1) After the switch is operated in UP direction, it is released in DOWN direction.

(2) After the switch is operated in DOWN direction, it is released in UP direction.



TYPICAL APPLICATIONS

Stop level detecting switches and door-open command switches for passenger and freight elevators, stop level detecting switches for vertical parking garages, passage point detecting switches for transport machineries and passage detector switches for general industrial machineries.

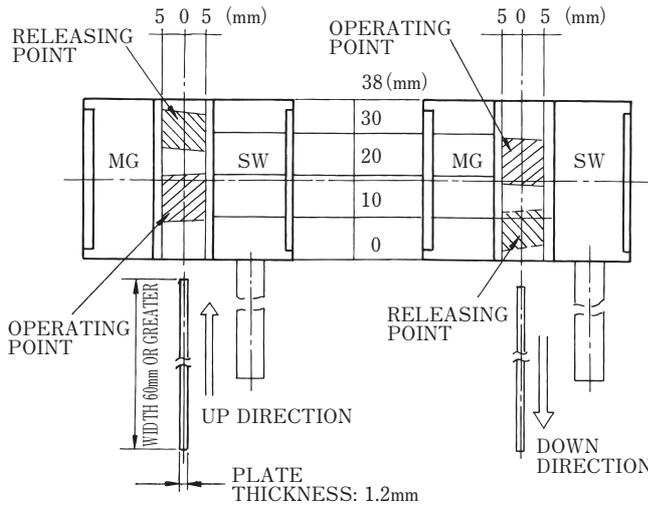
* 3. Refer to page 92 for degrees of protection.

4. Ultra-high precision products with even narrower operational range are also available.
For details, contact Yaskawa.

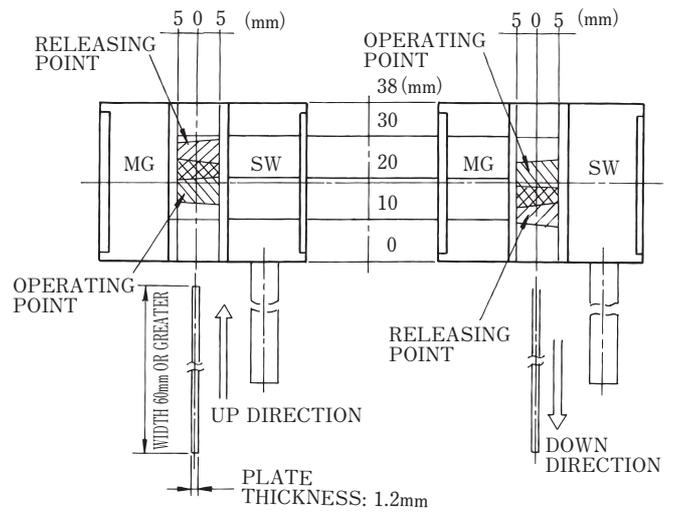
OPERATING CHARACTERISTICS

(Actuating range when the vane passes through in a horizontal direction at insertion depth of 40mm.)

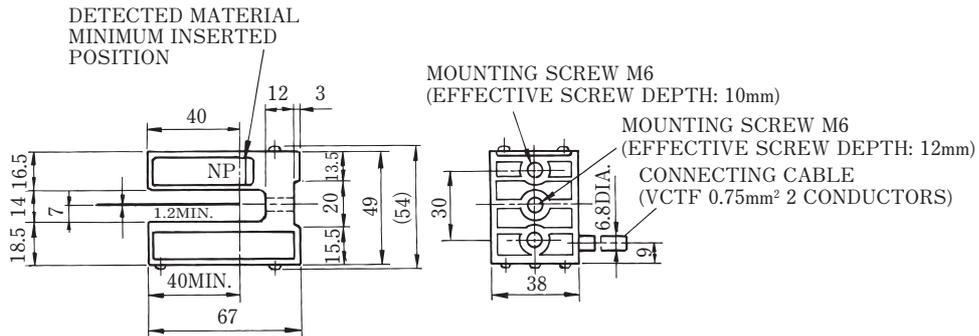
• Type PSMO-15G1



• Type PSMO-15G2



DIMENSIONS in mm



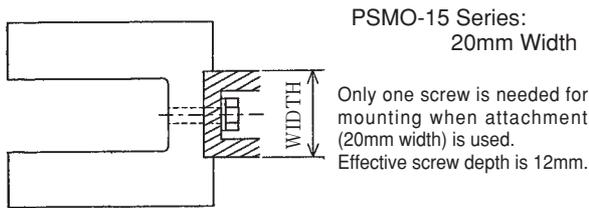
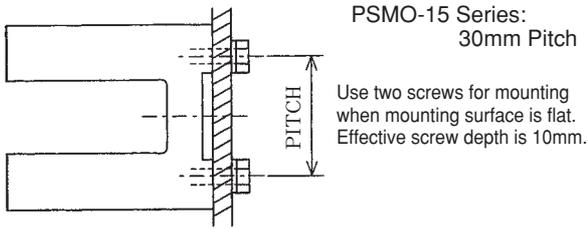
Approx. Weight: 0.4kg

- Note:
1. This switch operates by passage of magnetic materials. Provide insertion depth of 40mm or greater.
 2. When the switch is used in a DC circuit, connect the black lead to ⊕ and the white lead to ⊖.

NOTE FOR INSTALLATION

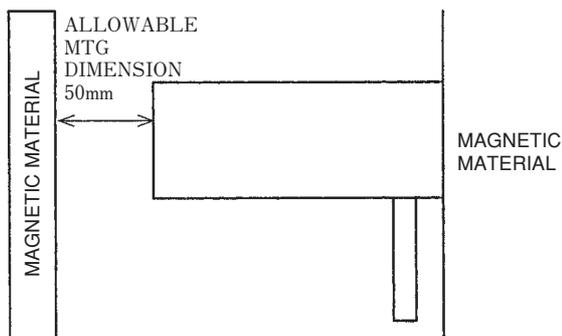
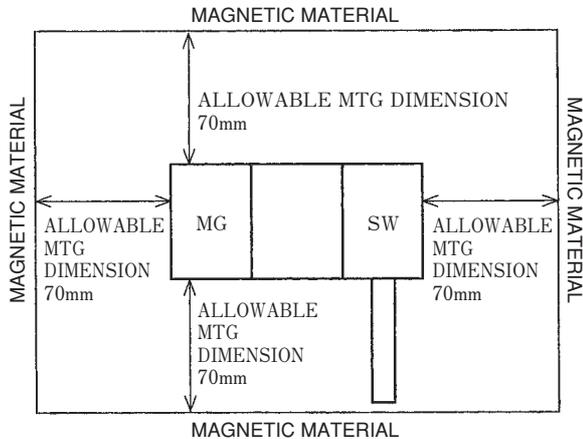
⚠ CAUTION

- MTG screw torque for M6 must be 3.2 to 3.9 (N · m) {33 to 40 (kgf · cm)}



⚠ CAUTION

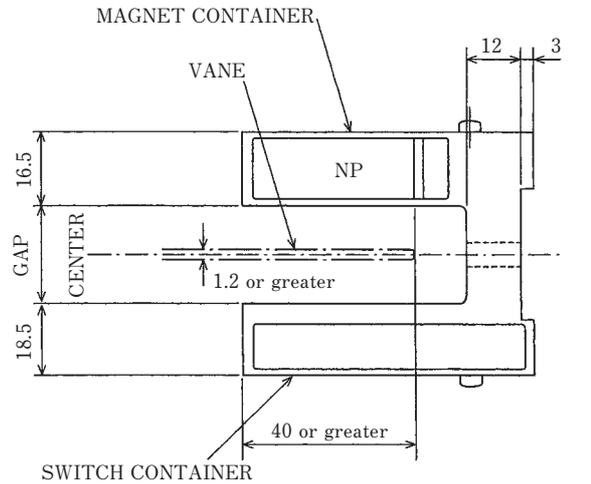
- Allowable mounting dimension for magnetic material
Operational characteristic can be changed when magnetic material is too close to these switches. Magnetic material should be outside of the range as illustrated below.



- Vane mounting
Vaness must be mounted securely so they will not contact the switches or be bent by permanent magnets incorporated in the switches.

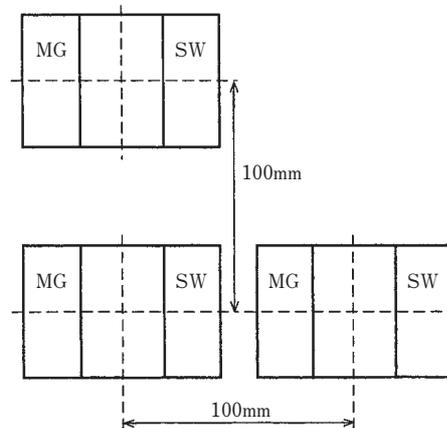
⚠ OBLIGATION

- Vane mounting position
Contacts incorporated in these switches operate and release by passage of vanes (Iron plates). Use magnetic materials (Plate thickness: 1.2 to 2.3mm, Width: 60mm or greater) such as ferromagnetic structure iron plate. The insertion depth in the detecting groove must be set further than the red line indicated on NP.



PSMO-15 SERIES: 14mm GAP

- Allowable mounting pitch
Allowable mounting pitch is 100mm or greater when more than one switch is mounted in parallel or multistage. (Operating characteristics can be changed. Confirm them after mounting.)



SEPARATE TYPE MAGNETIC PROXIMITY SWITCHES

Type PSMS (Medium-capacity)
(Large-capacity)

A Great Number of Combinations of Switch Units and Magnet Units Available to Set up an Best-Suited Detecting System

- Directly controls 100VDC or greater without any power supply unit or amplifying relay



RATINGS AND SPECIFICATIONS

• Medium-Capacity Type

Type	Switch Units	PSMS-R1G1	PSMS-R1G1T
	Magnet Units	PSMS-MP10	PSMS-MP10T
Rated Sensitive Distance mm		10	
Maximum Sensitive Distance mm		10 to 12	
Contact Arrangement		1NO	
Incorporated Bestact		R25	
Contact Performance		Refer to page 19.	
Rated Insulation Voltage		250VAC (Power Frequency)	
Insulation Characteristics	Insulation Resistance	5MΩ or greater (with 500VDC Megger)	
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)	
Vibration Resistance		IEC 61373 Category 1Class B	
Shock Characteristics		IEC 61373 Category 1Class B	
Enclosure*1		Almost equivalent to IP50	Almost equivalent to IP67
Connecting method (Cable)		0.75mm ² 2 conductors 1m long.	
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +60°C	
	Storage	-25 to +80°C	
Approx. Weight	Switch Units	0.1kg	
	Magnet Units	0.1kg	

Note: *1. Refer to page 92.

• Large-Capacity Type

Type	Switch Units	PSMS-R1E1	PSMS-R2E1	PSMS-R3E1	PSMS-R4E1	
	Magnet Units	PSMS-M105	PSMS-M215	PSMS-M325	PSMS-M450	PSMS-MX70
Rated Sensitive Distance mm*1		5	15	25	50	70
Maximum Sensitive Distance mm*2		8 to 11	16 to 24	30 to 40	65 to 85	100 to 110
Contact Arrangement		1NO				
Incorporated Bestact		R15				
Contact Performance		Refer to page 19.				
Rated Insulation Voltage		250VAC (Power Frequency)				
Insulation Characteristics	Insulation Resistance	5MΩ or greater (with 500VDC Megger)				
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 800VAC)				
Vibration Resistance		IEC 61373 Category 1Class B				
Shock Characteristics		IEC 61373 Category 1Class B				
Enclosure*3		Almost equivalent to IP67				
Connecting method (Cable)*4		1.25mm ² 2 conductors 1m long.				
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +60°C				
	Storage	-25 to +80°C				
Approx. Weight	Switch Units	0.1kg	0.2kg	0.3kg	0.9kg	
	Magnet Units	0.1kg	0.2kg	0.5kg	1.2kg	4.5kg

Note: *1. Detectable distance when both switches and magnet units are mounted on iron plates at ambient temperature of 20°C.

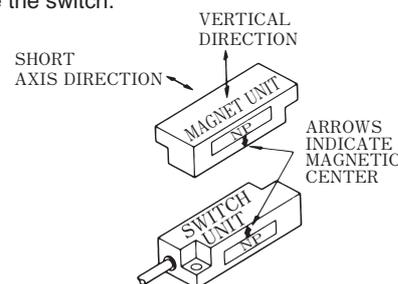
*2. This shows the maximum interval between units when the switches are mounted on non-magnetic materials at 20°C. (Value range shows performance variation of each product but not the variation due to repetitive operations.)

*3. Refer to page 92.

*4. Only switch units are equipped with a cable of 1 meter long.

OPERATING METHOD

Two actuation directions of the magnet available to operate the switch.



• Short axis direction

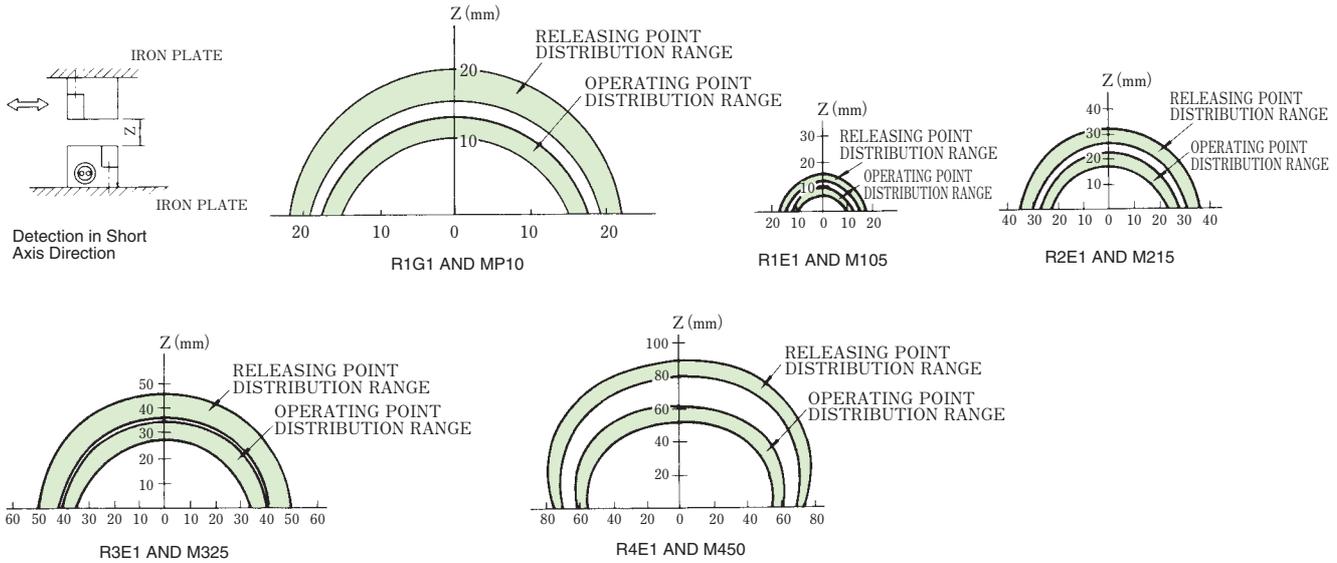
Easy to mount and the most stable operating characteristics are assured.

• Vertical direction

Operating characteristics are stable. However, a special mounting method should be taken depending on the stop condition.

OPERATING CHARACTERISTICS

<Short axis direction, vertical stroke range>

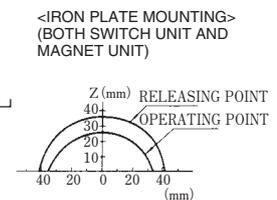
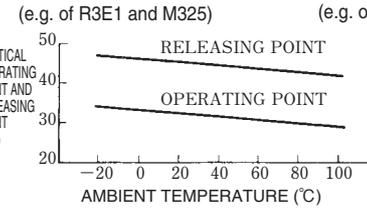
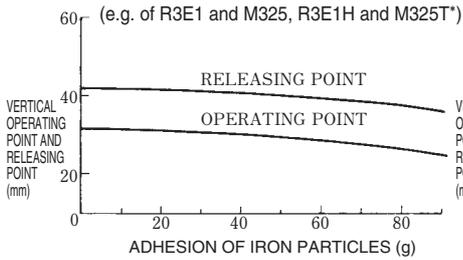


INFLUENCE BY ENVIRONMENTAL AND OPERATING CONDITIONS

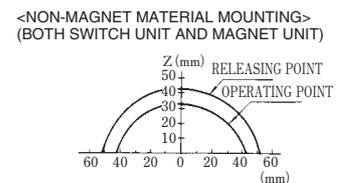
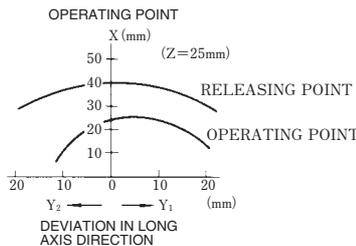
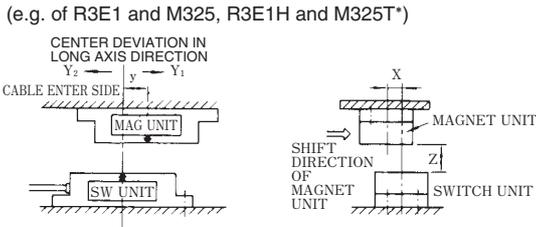
- Operating characteristics when iron particles are adhered (e.g. of R3E1 and M325, R3E1H and M325T*)
- Ambient temperature and operating characteristics (e.g. of R3E1 and M325)
- Comparison of performance when mounting on magnetic and non-magnetic materials (e.g. of R3E1 and M325)



Adhesion of iron particles (30g)
(If iron particles are adhered as shown in this picture, influence is only a little bit.)

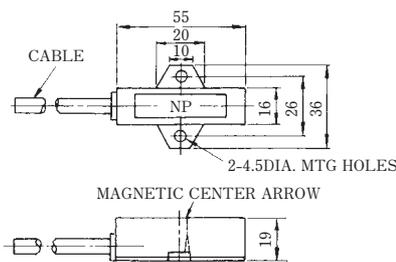


- Influence by deviance in long axis direction during short axis movement (e.g. of R3E1 and M325, R3E1H and M325T*)



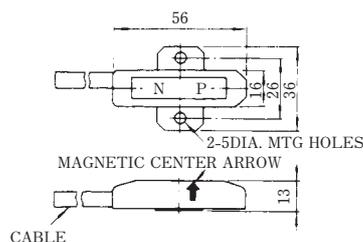
* Refer to page 77.

DIMENSIONS in mm



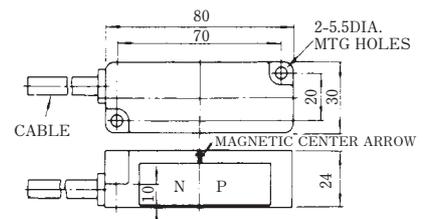
Weight: 0.1kg

Type PSMS-R1G1



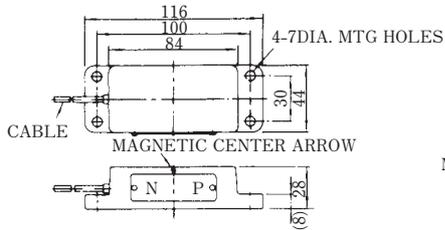
Weight: 0.1kg

Type PSMS-R1E1



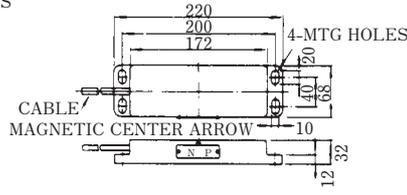
Weight: 0.2kg

Type PSMS-R2E1



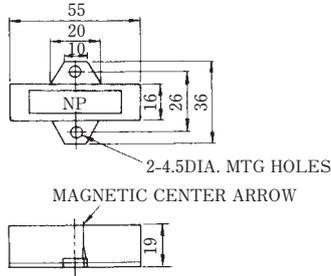
Weight: 0.3kg

Type PSMS-R3E1



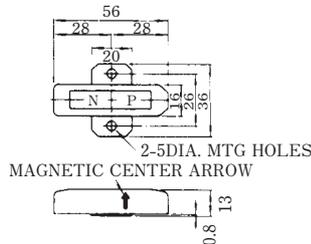
Weight: 0.9kg

Type PSMS-R4E1



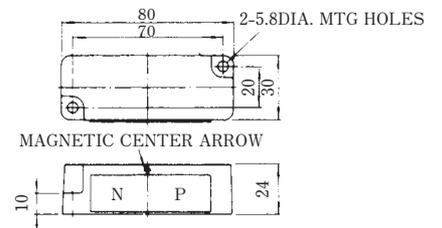
Weight: 0.1kg

Type PSMS-MP10



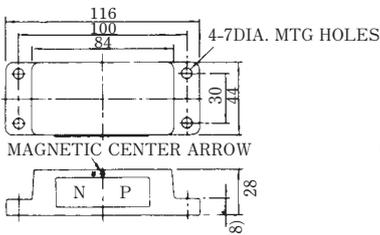
Weight: 0.1kg

Type PSMS-M105



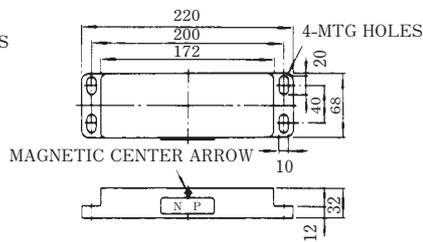
Weight: 0.2kg

Type PSMS-M215



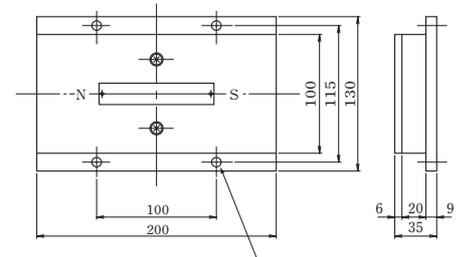
Weight: 0.5kg

Type PSMS-M325



Weight: 1.2kg

Type PSMS-M450



Weight: 4.5kg

Type PSMS-MX70

HOW TO USE

• Allowable magnet unit speed of detected materials (at 20°C)

Operating Conditions		Allowable Magnet Unit Speed in Short Axis Direction (mm/s)
Type of Magnet Unit	Detecting Distance (mm)	
PSMS-M105	5	320 or less
PSMS-M215	15	625 or less
PSMS-M325	25	770 or less

Note: 1. Values tabulated above are based on the switch unit ON time: 50ms.
2. When the speed is faster than above, mount the magnet units in parallel.

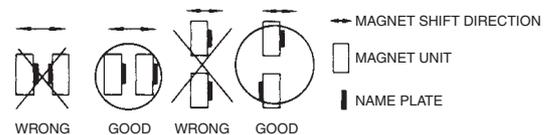
• Connection

When the switch is used in a DC circuit, connect the black lead wire to ⊕ terminal.

• Mounting

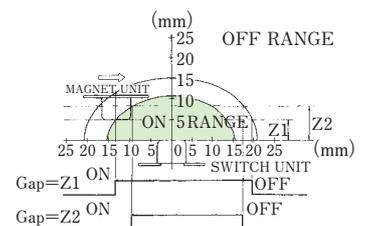
- (1) Unit can even be mounted to flat magnetic materials such as iron plates. However, do not mount the units so that they are surrounded by magnetic materials.
- (2) When mounting the units, align the magnetic center arrows each other to adjust the misalignment in long axis direction.

- (3) There is no interference with each other if two or more switch units are mounted in parallel. Thus, it is possible to determine the required mounting pitch in combination for individual actuation range.
- (4) When mounting two or more magnet units in parallel, follow the instruction illustrated below for the direction of magnet polarity (N or S). The nameplate are good indications for the direction.



• How to adjust the gap

The contact operates when the center of the magnet unit passes ON and OFF area.



MEMORY TYPE MAGNETIC PROXIMITY SWITCHES

Type PSMM

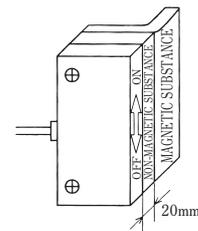
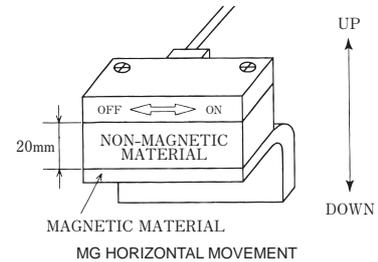
Self-Holding Type Magnetic Proximity Switches Make Sequencing Simple

RATINGS AND SPECIFICATIONS

Type	Switch Units	PSMM-RPE1	PSMM-RPE1T2
	Magnet Units	PSMM-MP15	
Rated Sensitive Distance mm*1		15 (when mounted on non-magnetic materials)	
Maximum Sensitive Distance mm*1		8 to 16	
Contact Arrangement		1NO	
Incorporated Bestact		R15	
Contact Performance		Refer to page 19.	
Rated Insulation Voltage		250VAC (Power Frequency)	
Insulation Characteristics	Insulation Resistance	100MΩ or greater (with 500VDC Megger)	
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 800VAC)	
Vibration Resistance*2		49m/s ² {5G} (10 to 55Hz)	
Shock Resistance*2		98m/s ² {10G}	
Enclosure*3		Almost equivalent to IP52	Almost equivalent to IP67
Connecting method (Cable)*4		0.75mm ² 2 conductors 1m long.	
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +60°C	
	Storage	-25 to +80°C	
Approx. Weight	Switch Units	0.2kg	
	Magnet Units	0.2kg	



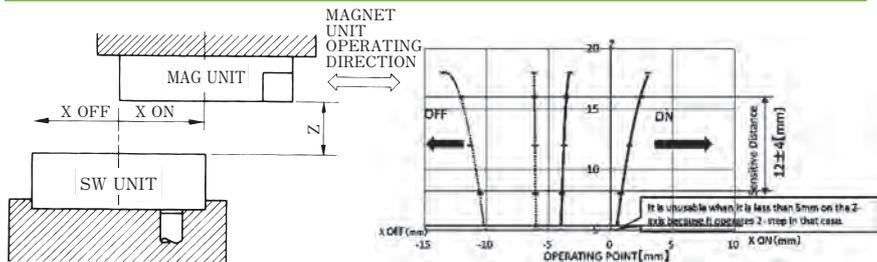
MOUNTING



- Note: *1. At ambient temperature of 20°C. Sensitive distance where ambient temperature T (°C) can be calculated by the following equation.

$$\text{Sensitive distance (mm)} = \text{Rated sensitive distance} \times \{1 - 0.0018 (T - 20)\}$$
*2. Values when the switch unit is mounted correctly on a non-magnetic material. These values can decline depending on a magnetic material and mounting direction.
*3. Refer to page 92.
*4. Only switch units are equipped with a cable.

OPERATING CHARACTERISTICS

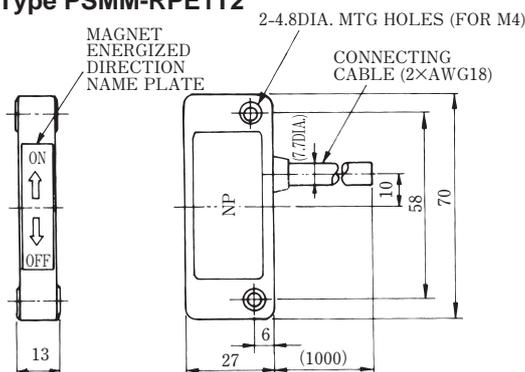


OPERATING METHOD

The magnet unit that switches the contact moves in long axis direction. When the magnet moves to ON side, the contact is turned on and maintained.

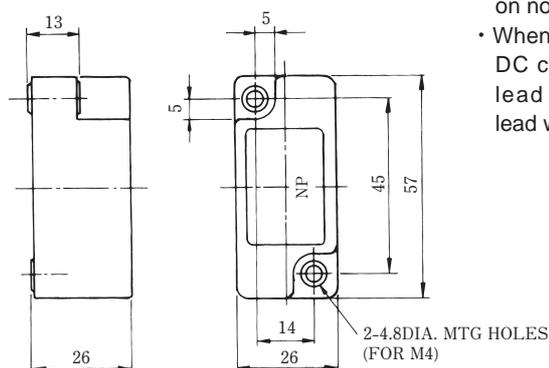
DIMENSIONS in mm

Type PSMM-RPE1U (Switch Unit)
Type PSMM-RPE1T2



Weight: 0.2kg

Type PSMM-MP15U (Magnet Unit)



Weight: 0.1kg

- This unit should be mounted on non-magnetic materials.
- When the switch is used in a DC circuit, connect brown lead wire to ⊕, and blue lead wire to ⊖.

VANE TYPE HIGH-TEMPERATURE-USE MAGNETIC PROXIMITY SWITCHES

Type PSMO-H

Unsurpassed Performance at High Temperature, Humidity Atmosphere; Exceeding any Non-Contact Types. Continuous operation is possible under 130°C

- Direct control of 100VDC or greater, no power supply unit or amplifying relay needed
- No erroneous operation or breakdown in circuit due to noise and surge
- Contactless design assures long service life and maintenance-free operation



RATINGS AND SPECIFICATIONS

Type	PSMO-25E1TH	PSMO-25E2TH
Groove Width mm	25	
Groove Depth mm	120	
Contact Arrangement	1NO	1NC
Incorporated Bestact	R15	
Contact Performance	Refer to page 19.	
Rated Insulation Voltage	250VAC (Power Frequency)	
Insulation Characteristics	Insulation Resistance	5MΩ or greater (with 500VDC Megger)
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 800VAC)
Vibration Resistance	IEC 61373 Category 1Class B	
Shock Characteristics	IEC 61373 Category 1Class B	
Standard Vane Detected mm	t2.3×60×100 or greater	
Enclosure *2	Almost equivalent to IP67	
Connecting method (Cable)	0.75mm ² 2 conductors 3m long.	
Ambient Temperature (With no freezing or condensation)	Operating	-25 to +130°C
	Storage	-40 to +150°C
Approx. Weight	1.4kg	

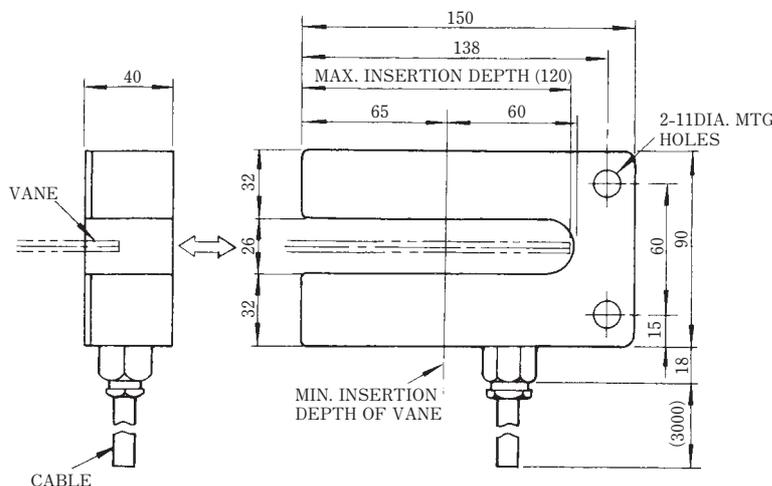
Note: 1. As for ratings and specifications other than tabulated above, refer to those of standard types on page 65.
*2. Refer to page 92.

TYPICAL APPLICATIONS

Continuous casting machines, coke ovens, converters, rolling mills, cement curing ovens, equipment in refrigerators.

DIMENSIONS in mm

• Type PSMO-25E□TH



Weight: 1.4kg

Influence of ambient temperature and compensation

Where temperature varies widely from the beginning and during operation, the actuating point and return point may change a little due to the thermal characteristics of the magnetic unit. Therefore, for applications requiring higher accuracy, compensate for the change before mounting.

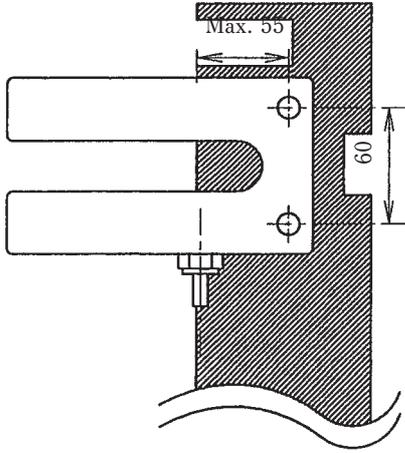
Connection

- When the switch is used in a DC circuit, connect black lead wire to ⊕, and white lead wire to ⊖.

NOTE FOR INSTALLATION

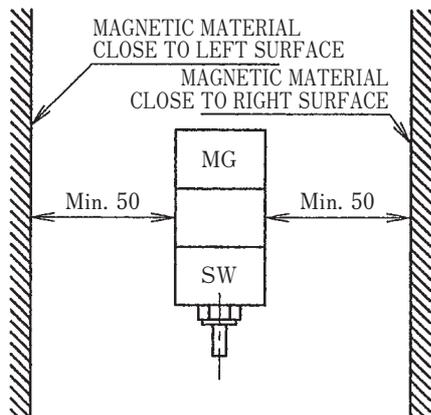
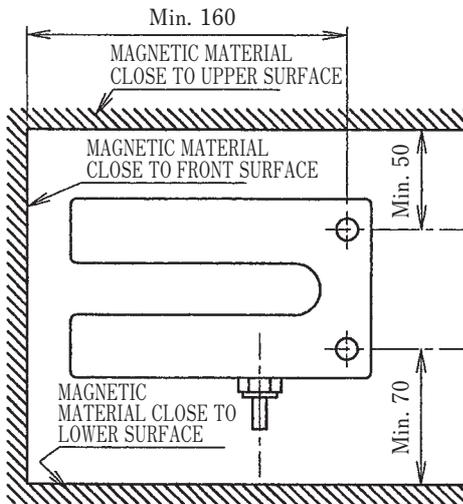
⚠ CAUTION

● Allowable mounting dimension for these switches. These switches must be mounted with the center of the mounting holes less than 55mm from the edge of the mounting surface.



⚠ CAUTION

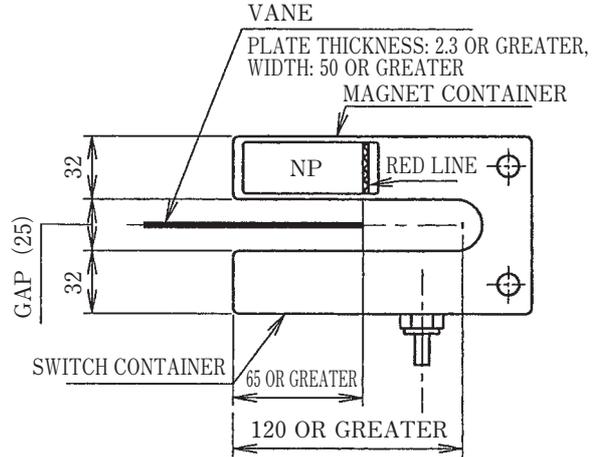
● Allowable mounting dimension for magnetic material. Operating characteristics can be changed when magnetic material is approaching these switches. Magnetic material should be outside of the range as illustrated below.



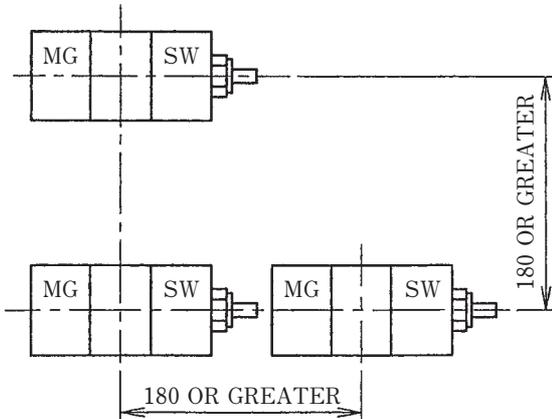
● Vane mounting
Vanes must be mounted securely so they will not contact the switches or be bent by permanent magnets incorporated in the switches.

⚠ OBLIGATION

● Vane mounting position
Contacts incorporated in these switches operate and release by passage of vanes (Iron plates). Use magnetic materials (Plate thickness: 2.3mm or greater, Width: 50mm or greater) such as ferromagnetic structure iron plate. The insertion depth in the detecting groove must be set further than the red line indicated on NP.



● Allowable mounting pitch
Allowable mounting pitch is 180mm or greater when more than one switch is mounted in parallel or multistage. (Operating characteristics can be changed. Confirm them after mounting.)



SEPARATE TYPE HIGH-TEMPERATURE-USE MAGNETIC PROXIMITY SWITCHES

Type PSMS-H, -T

Designed for High Temperature, High Humidity Atmosphere; Exceeding any Non-Contact Types. Continuous operation is possible under 130°C

- Direct control of 100VDC or greater, no power supply unit or amplifying relay needed
- No erroneous operation or breakdown in circuit due to noise and surge
- Contactless design assures long service life and maintenance-free operation



RATINGS AND SPECIFICATIONS

Type	Switch Units	PSMS-R2E1H	PSMS-R3E1H		
	Magnet Units	PSMS-M215T	PSMS-M325T	PSMS-M450T	PSMS-MX70T
Rated Sensitive Distance mm*1		15	25	50	70
Maximum Sensitive Distance mm*2		16 to 24	30 to 40	65 to 85	100 to 110
Contact Arrangement		1NO			
Rated Insulation Voltage		250VAC (Power Frequency)			
Incorporated Bestact		R15			
Contact Performance		Refer to page 19.			
Insulation Characteristics	Insulation Resistance	5MΩ or greater (with 500VDC Megger)			
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 800VAC)			
Vibration Resistance		IEC 61373 Category 1Class B			
Shock Characteristics		IEC 61373 Category 1Class B			
Enclosure*3		Almost equivalent to IP67			
Connecting method (Cable)*5		0.75mm ² 2 conductors 3m long			
Ambient Temperature (With no freezing or condensation)	Operating	-25 to +130°C			
	Storage	-40 to +150°C			
Approx. Weight	Switch Units	0.2kg	0.3kg		
	Magnet Units	0.2kg	0.5kg	1.2kg	4.5kg

- Note: *1. Detectable distance at ambient temperature of 20°C when both the switches and the magnet units are mounted on iron plates. Setting gap where ambient temperature T (°C) can be calculated by the following equation.
Setting gap (mm) = Rated sensitive distance × {1 - 0.0018 (T - 20)}
- *2. Maximum detectable distance when the switch is mounted on a non-magnetic material. (Value range shows performance variation of each product but not the variation due to repetitive operations.)
- *3. Refer to page 92.
- *4. As for ratings and specifications other than tabulated above, refer to those of standard types on page 71.
- *5. Only switch units are equipped with a cable.

TYPICAL APPLICATIONS

Continuous casting machines, coke ovens, converters, rolling mills, cement curing ovens, equipment in refrigerators.

Influence of ambient temperature and compensation

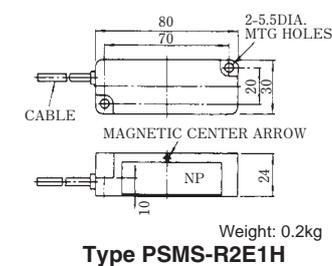
Where temperature varies widely from the beginning and during operation, the actuating point and return point may change a little due to the thermal characteristics of the magnetic unit.

For applications requiring higher accuracy, compensate for the change before mounting.

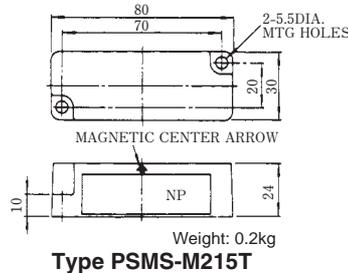
Connection

- When the switch is used in a DC circuit, connect black lead wire to ⊕, and white wire to ⊖.

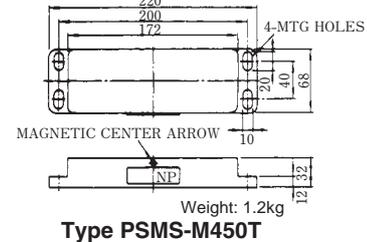
DIMENSIONS in mm



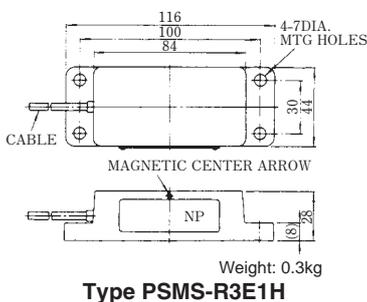
Type PSMS-R2E1H



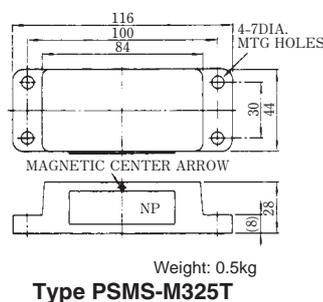
Type PSMS-M215T



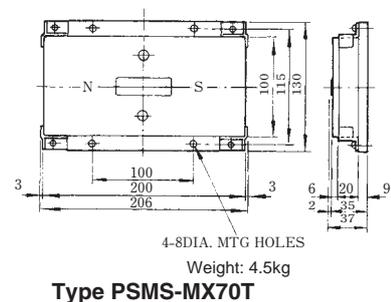
Type PSMS-M450T



Type PSMS-R3E1H



Type PSMS-M325T



Type PSMS-MX70T

MEMORY TYPE HIGH-TEMPERATURE-USE MAGNETIC PROXIMITY SWITCHES

Type PSMM-H, -T

Stable Self-Holding Performance at High Temperature and Humid Atmosphere

- Resistant to continuous duty at 130°C
- Simplified sequence circuit with no external self-holding circuit needed.



RATINGS AND SPECIFICATIONS

Type	Switch Units	PSMM-R3E1H		
	Magnet Units	PSMM-M325T	PSMM-M450T	PSMM-MX70T
Rated Sensitive Distance mm*1		25	50	70
Maximum Sensitive Distance mm*2		10 to 35	10 to 60	10 to 85
Contact Arrangement		1NO		
Rated Insulation Voltage		250VAC (Power Frequency)		
Incorporated Bestact		R15		
Contact Performance		Refer to page 19.		
Insulation Characteristics	Insulation Resistance	5MΩ or greater (with 500VDC Megger)		
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 800VAC)		
Vibration Resistance*2		IEC 61373 Category 1Class B		
Shock Characteristics*2		IEC 61373 Category 1Class B		
Enclosure*3		Almost equivalent to IP67		
Connecting method (Cable)*5		0.75mm ² 2 conductors 3m long.		
Ambient Temperature (With no freezing or condensation)	Operating	-25 to +130°C		
	Storage	-40 to +150°C		
Approx. Weight	Switch Units	0.4kg		
	Magnet Units	0.5kg	1.6kg	2.5kg

Note: * 1. Detectable distance at ambient temperature of 20°C when both the switches and the magnet units are mounted on iron plates. Setting gap where ambient temperature T (°C) can be calculated by the following equation.

$$\text{Setting gap (mm)} = \text{Rated sensitive distance} \times \{1 - 0.0018 (T - 20)\}$$

- * 2. Values when the switch unit is mounted correctly on a non-magnetic material. These values can decline depending on mounting of a magnetic material and mounting direction.
- * 3. Refer to page 92.
- * 4. As for ratings and specifications other than tabulated above, refer to standard types on page 74.
- * 5. Only switch units are equipped with a cable.

TYPICAL APPLICATIONS

Continuous casting machines, coke ovens, converters, rolling mills, cement cure ovens, equipment in refrigerators.

Influence of ambient temperature and compensation

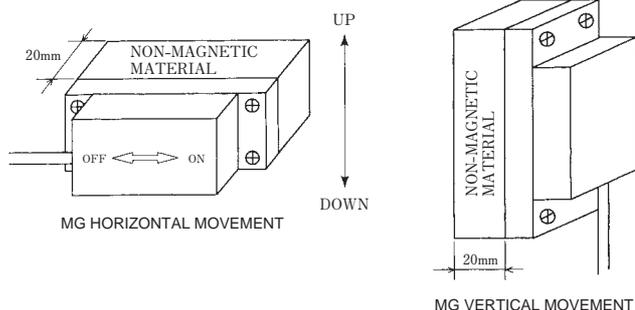
Where temperature varies widely from the beginning and during operation, the actuating point and return point may change a little due to the thermal characteristics of the magnetic unit.

For applications requiring higher accuracy, compensate for the change before mounting.

Connection and Mounting

- When the switch is used in a DC circuit, connect black lead wire to ⊕, and white wire to ⊖.

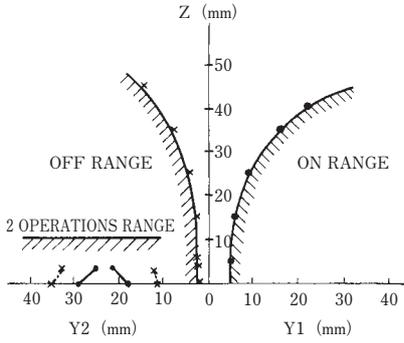
MOUNTING



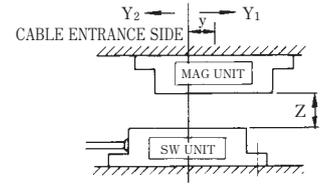
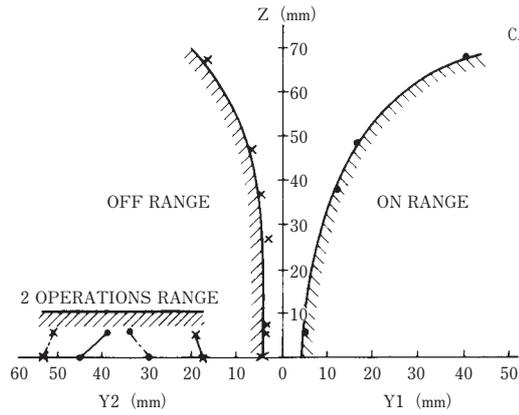
OPERATING CHARACTERISTICS

(The switch unit is mounted on a non-magnetic material, and the magnet unit is on a ferromagnetic material.)

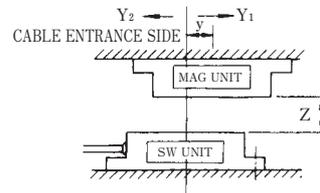
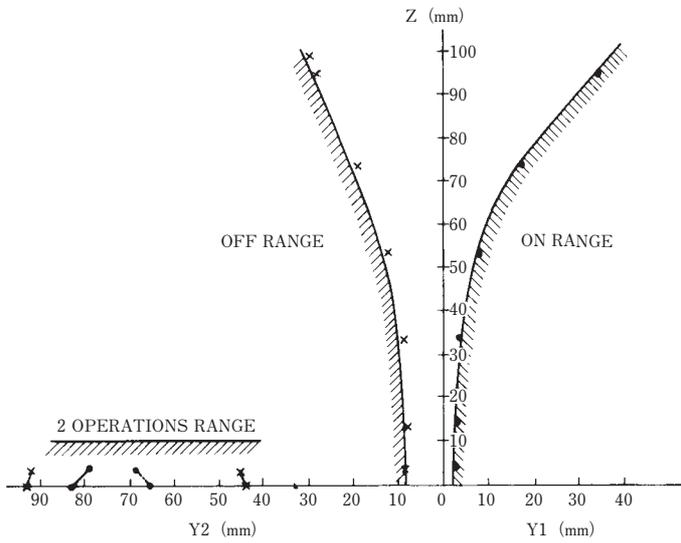
(1) Type PSMM-M325T



(2) Type PSMM-M450T



(3) Type PSMM-MX70T

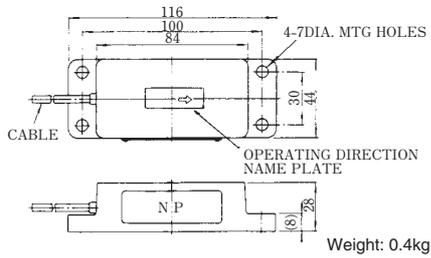


Note:

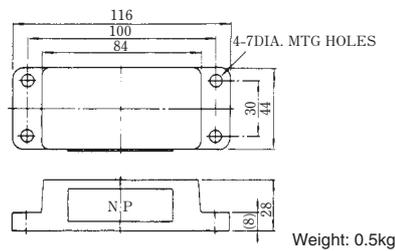
Shown here are typical examples. ON and OFF points vary depending on each product and mounting condition.

Where the switch unit is mounted on a ferromagnetic material, the operating characteristics may change.

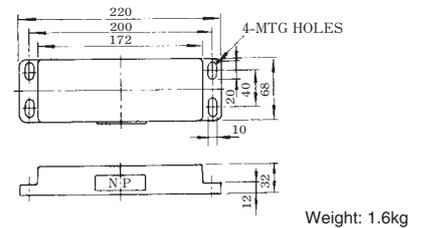
DIMENSIONS in mm



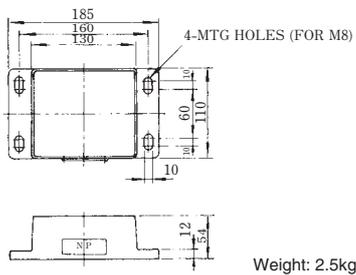
Type PSMM-R3E1H



Type PSMM-M325T



Type PSMM-M450T



Type PSMM-MX70T

COLUMN TYPE MAGNETIC PROXIMITY SWITCHES

Type PSMS-RV,-MV

Superior space, cost saving and no power supply is needed compared to conventional column type inductive sensor.

- Type PSMS-RV incorporating Bestact is best suited for position detectors in an adverse environment such as high temperature, high humidity or direct sunlight.
- Misalignment is allowed in all directions within the operating curve. The end user can adjust the mounting of the parts within the operating curve as needed.
- No power supply unit or amplifying relay needed.



RATINGS AND SPECIFICATIONS

Purpose		General Purpose	High Temperature Purpose			
Type	Switch Unit	PSMS-RV1G1T	PSMS-RV1G1TH	PSMS-RV3G1TH	PSMS-RV3G1THL	PSMS-RV4G1THL
	Magnet Unit	PSMS-MV10TH		PSMS-MV10THA		
Installation of Magnet Units		M6 STUD		M8 STUD		
Rated Sensitive Distance mm		10				
Contact Arrangement		1NO				
Rated Insulation Voltage		250VAC (Power Frequency)				
Incorporated Bestact		R25				
Contact Performance		Refer to page 19.				
Insulation Characteristics	Insulation Resistance	5M Ω or greater (with 500VDC Megger)				
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)				
Vibration Resistance		IEC 61373 Category 1Class B				
Shock Characteristics		IEC 61373 Category 1Class B				
Enclosure*1		Almost equivalent to IP67				
Connecting method (Cable)*2		0.75mm ² 2 conductors 1m long.				
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +60°C	-25 to +130°C			
	Storage	-20 to +80	-30 to +130°C			
Approx. Weight	Switch Units	0.1kg		0.2kg	0.3kg	
	Magnet Units	0.1kg				

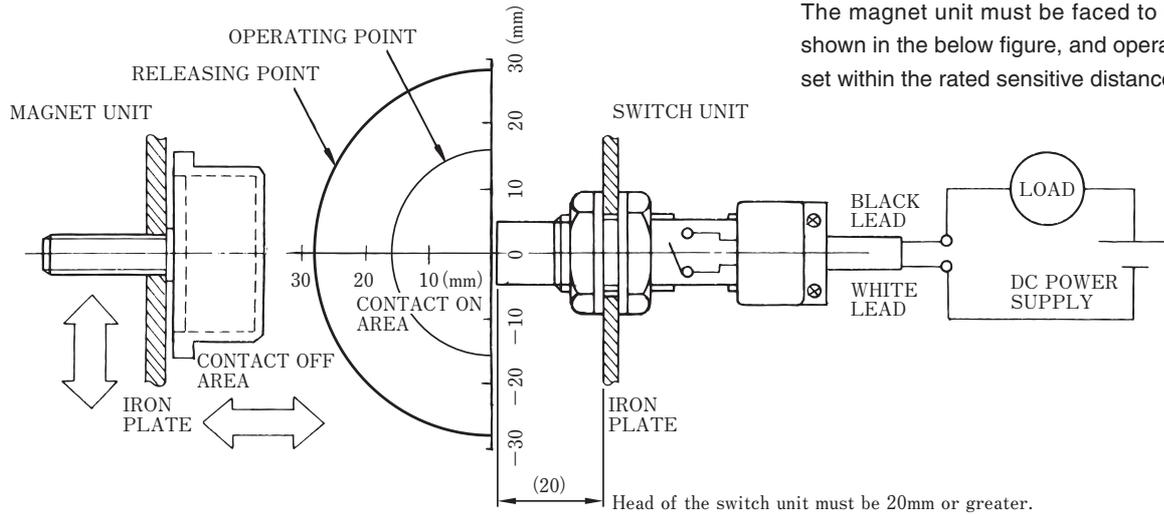
Note: * 1. Refer to page 92.

* 2. Only switch units are equipped with a cable.

TYPICAL APPLICATIONS

- Position detectors for an adverse atmosphere in steel plant/cement producing equipment
- Door-zone detectors for elevators
- Position detectors for escalators
- Position detectors for general industrial machinery like vertical parking garages
- Auxiliary contacts for heavy machinery like disconnectors

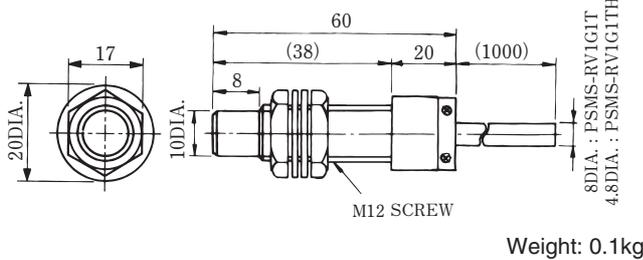
DRIVING METHOD AND SENSITIVE DISTANCE



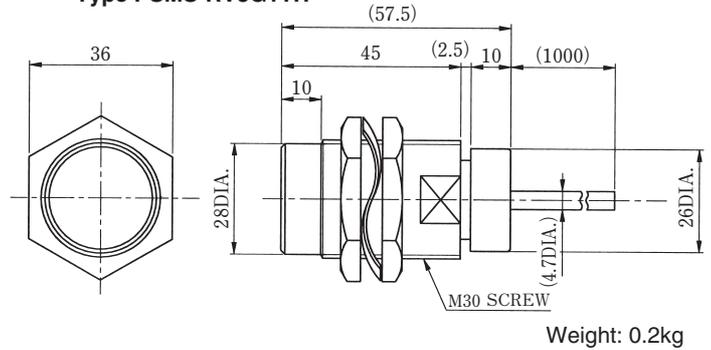
DIMENSIONS in mm

SWITCH UNIT

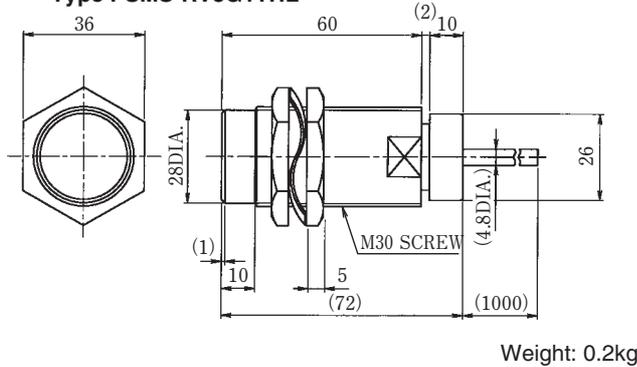
- Type PSMS-RV1G1T: with General Cable
- Type PSMS-RV1G1TH: with Heatproof Cable



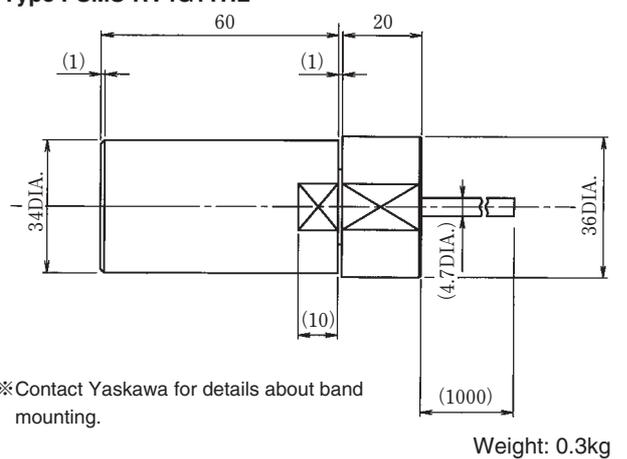
- Type PSMS-RV3G1TH



- Type PSMS-RV3G1THL



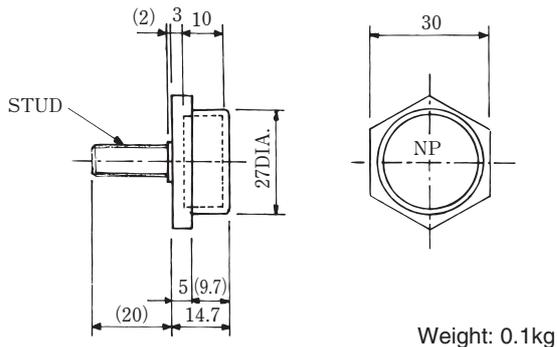
- Type PSMS-RV4G1THL



※ Contact Yaskawa for details about band mounting.

MAGNET UNIT

- Type PSMS-MV10TH: M6 STUD
- Type PSMS-MV10THA: M8 STUD

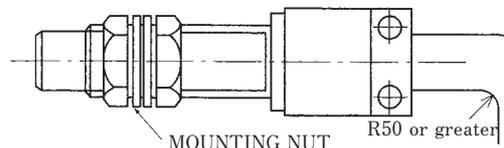


Note: where the switch is used in a DC circuit, connect the black lead wire to ⊕ and white lead wire to ⊖.

NOTE FOR INSTALLATION

CAUTION

- Tightening torque of the mounting nut
 PSMS-RV1G1T (H) ... 16.6 to 23.5 (N · m) {170 to 240 (kgf · cm)}
 PSMS-RV3G1TH (L) ... 49 to 78 (N · m) {500 to 800 (kgf · cm)}



- Do not twist the cable less than R50.

In recent years, high contact reliability in low-level signals has been required for micro switches used in field equipments.

However, general air break contacts cannot meet the requirements for use in field environments and the low-level voltages of control circuits.

Micro switches incorporating the hermetically sealed glass contact "Bestact" can solve these problems.

APPEARANCE



FEATURES

- **High contact reliability**
Hermetically sealed glass contact "Bestact" provides high contact reliability with no aging.
- **Contact arrangement**
1NO and 1NC contact arrangement. (It can be identified by roller color even after mounting.)
- **Applicable for a wide range of control loads**
Best suited for use in power circuits and also infrequently used low-level signal circuits.
(From inductive load control of 220 VAC, 0.5A or 110VDC, 0.3A to direct input for 5VDC photo-coupler.)
- **Compact size**
12.4mm(w)×50mm(h)×45mm(l)

CONTACT RATINGS AND SPECIFICATIONS

Type		PPUU-G10	PPUU-G01
Contact Arrangement		1NO	1NC
Rated Insulation Voltage		250VAC (Power Frequency)	
Incorporated Bestact		R25	
Contact Performance		Refer to page 19.	
Insulation Characteristics	Insulation Resistance	20MΩ or greater (with 500VDC Megger)	
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)	
Vibration Resistance		IEC 61373 Category 1Class B	
Shock Characteristics		IEC 61373 Category 1Class B	
Enclosure*1		Almost equivalent to IP50	
Connecting method		Screw size : M3x8	
Ambient Temperature (With no freezing or condensation)	Operating	-25 to +80°C	
	Storage		
Approx. Weight		0.1kg	

Note: Do not rapidly release when pushing a lever.

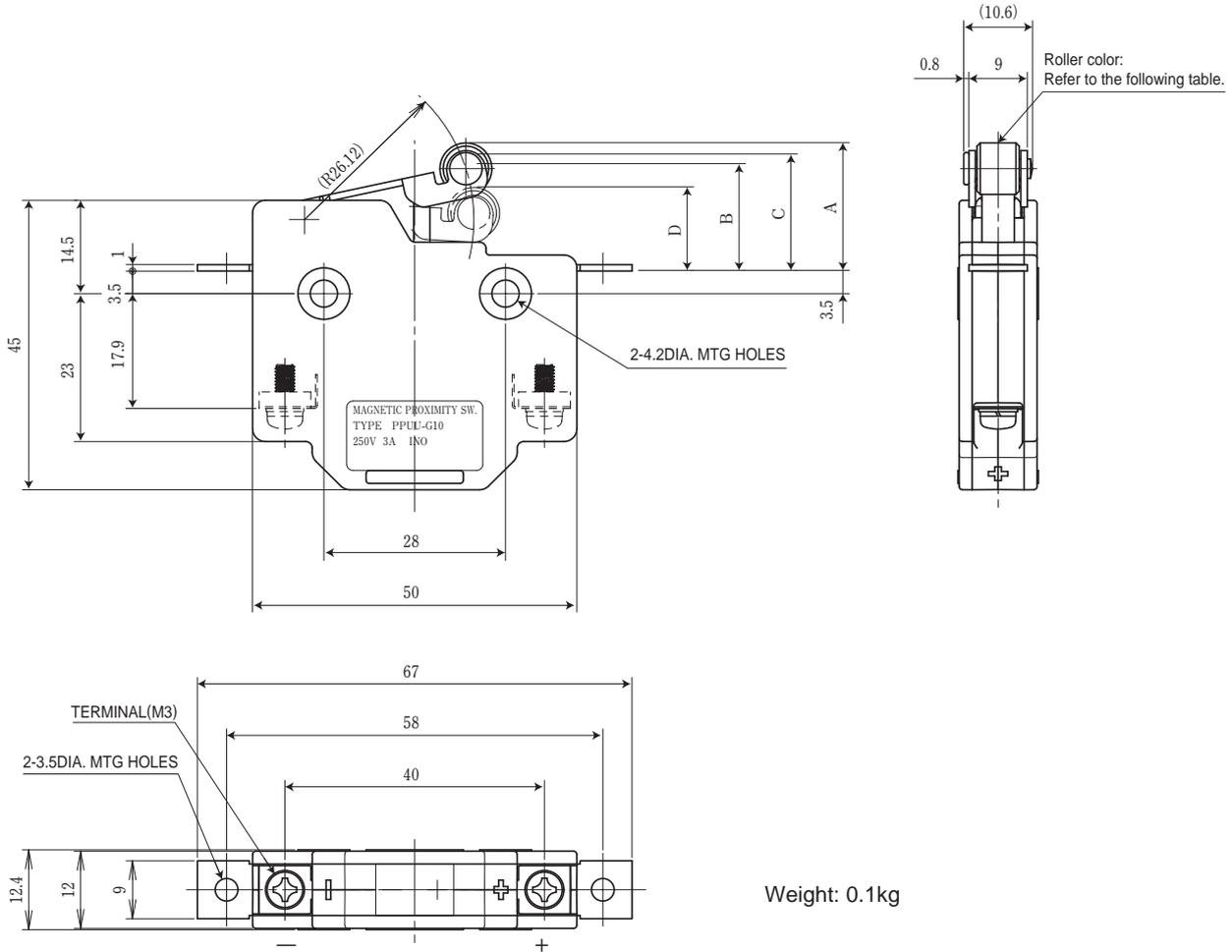
* 1. Refer to page 92.

2. Do not rapidly release when pushing a lever.

PRECAUTIONS FOR USE

- Bestact incorporated in the switch is a glass sealed contact. Do not drop it and do not add any excessive force to it. Failure to follow this instruction may result in a change of operating characteristics and performance degradation by damaging a glass.
- Contacts have a polarity. When the switch is used in a DC circuits, connect cables according to the polarity \oplus/\ominus indicated on a terminal screw part.

DIMENSIONS in mm



Operating Characteristics

Size	Remarks
A=19.5 or greater	Stationary Position
B=15.0 or greater	Operating Position
C=19.0 or less	Releasing Position
D=13.0	Limit Position When Pushing Levers

Identification of Contact Arrangement

Type	PPUU-G10	PPUU-G01
Roller Color	White	Black

PRECAUTIONS FOR MOUNTING

CAUTION

- Switch mounting screw torque must be $3.9 \text{ N}\cdot\text{m}$ ($31.5 \text{ kg f}\cdot\text{cm}$) $\pm 10\%$ (Do not tighten screws too firmly to prevent them from damaging.)

RESTRICTION

- This switch cannot be used where dust and cutting powder are present. (They might come into a gear in the switch and lock it.)

PRECAUTIONS FOR WIRING

CAUTION

- Connecting wire must be 2mm^2 or less.
- Terminal screw torque must be $0.45 \text{ N}\cdot\text{m}$ ($4.5\text{Kg f}\cdot\text{cm}$) $\pm 10\%$. (Do not tighten screws too firmly to prevent them from damaging.)

ROD PLUNGER TYPE AUXILIARY CONTACTS

Type PSPD-G
Type PPMU-G
Type PPMU-E

FEATURES

- High contact reliability with no aging by incorporating a glass sealed contact.

TYPICAL APPLICATIONS

- Auxiliary contact units
- Door control devices for rolling stocks
- Auxiliary contacts for breakers(Type PPMU-E)



RATINGS AND SPECIFICATIONS

- Type PSPD-07G

Type		PSPD-07G20	PSPD-07G11	PSPD-07G02
Contact Arrangement		2NO	1NO1NC	2NC
Rated Insulation Voltage		250VAC (Power Frequency)		
Incorporated Bestact		R25		
Contact Performance		Refer to page 19.		
Insulation Characteristics	Insulation Resistance	20MΩ or greater (with 500VDC Megger)		
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)		
Vibration Resistance		IEC 61373 Category 1Class A		
Shock Characteristics		IEC 61373 Category 1Class A		
Operating Force		3.2N(0.33kg)±1N(0.1kg) (Initial pressure), 5.5N(0.56kg) ±2N(0.2kg) (Stroke: 6.5mm)		
Enclosure*1		Almost equivalent to IP50		
Connecting method		Screw size : M4×6		
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +60°C		
	Storage			
Approx. Weight		0.1kg		

Note: * 1. Refer to page 92.

2. Do not rapidly release when pushing a pole.

· Type PPMU-G

Type		PPMU-G40	PPMU-G31	PPMU-G22	PPMU-G13	PPMU-G04
Contact Arrangement		4NO	3NO1NC	2NO2NC	1NO3NC	4NC
Rated Insulation Voltage		250VAC (Power Frequency)				
Incorporated Bestact		R25				
Contact Performance		Refer to page 19.				
Insulation Characteristics	Insulation Resistance	20MΩ or greater (with 500VDC Megger)				
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)				
Vibration Resistance		IEC 61373 Category 1Class B				
Shock Characteristics		IEC 61373 Category 1Class B				
Operating Force		2.9N(0.3kg)±1N(0.1kg) (Initial pressure), 4.9N(0.5kg) ±2N(0.2kg) (Stroke: 7mm)				
Enclosure *1		Almost equivalent to IP50				
Connecting method		Screw size : M4×8				
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +60°C				
	Storage					
Approx. Weight		0.2kg				

Note: * 1. Refer to page 92.

2. Do not rapidly release when pushing a pole.

· Type PPMU-E

Type		PPMU-E (First shows NO contact number and second shows NC contact number.)					
Contact Arrangement		1db + Glass sealed contact (5contacts) {NO or NC}					
Rated Insulation Voltage		250VAC (Power Frequency)					
Incorporated Bestact		Open contact	R15				
Contact Performance	Rated Continuous Current *1	5A		Refer to page 19.			
	Rated Operating Current	AC	250V, 3A				
		DC	110V, 0.5A (Time Constant : 100ms)				
	Maximum Breaking Current	110VDC, 5A (Time Constant : 100ms)					
	Contact Resistance	100mΩ or less					
	Minimum Operating Current	100VDC 10mA					
Insulation Characteristics	Insulation Resistance	100MΩ or greater (with 500VDC Megger)					
	Withstand Voltage (Power Frequency)	2500VAC for 1 minute (Across Open Contacts: 2500VAC)		2500VAC for 1 minute (Across Open Contacts: 800VAC)			
Vibration Resistance		IEC 61373 Category 1Class B					
Erroneous Operation		IEC 61373 Category 1Class B					
Operating Force		Initial pressure : 2.9N (300gf), Terminal pressure : 7.8N (800gf) (Stroke : 9mm)					
Enclosure *2		Almost equivalent to IP50 (Except for 1db contact)					
Connecting method		Screw size : M4×8					
Ambient Temperature (With no freezing or condensation)	Operating	-20 to +80°C					
	Storage						
Approx. Weight		0.3kg					

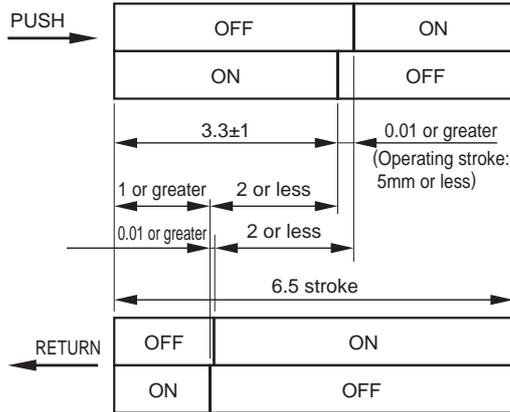
Note: * 1. This is the current that can be energized to switching part continuously without exceeding the allowable temperature rise of each part under the condition without contact switching.

* 2. Refer to page 92.

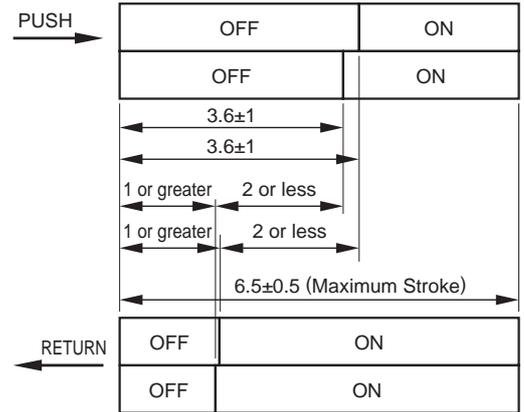
* 3. Do not rapidly release when pushing a pole.

Operating Characteristics

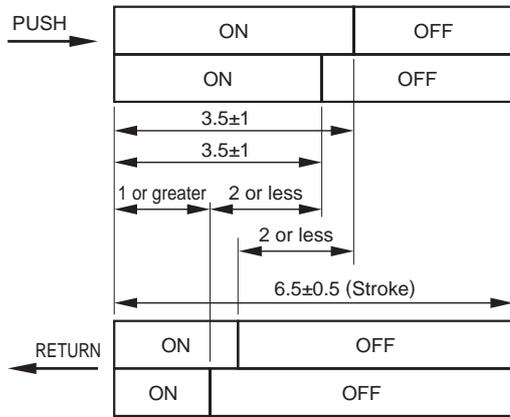
• Type PSPD-07G11



• Type PSPD-07G20



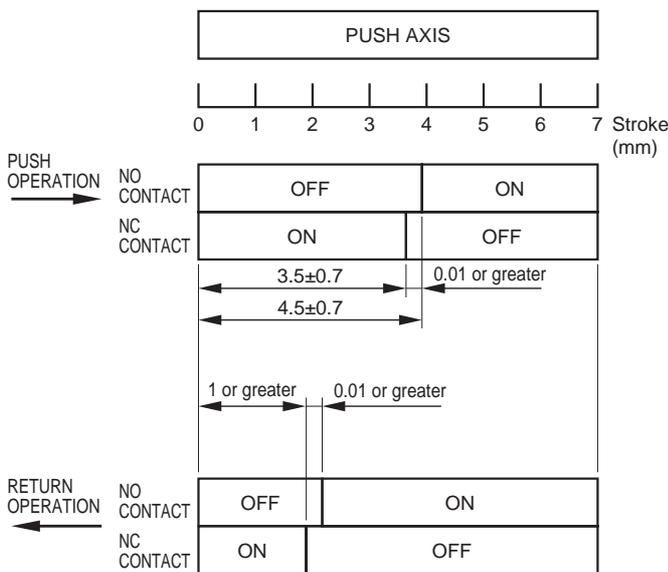
• Type PSPD-07G02



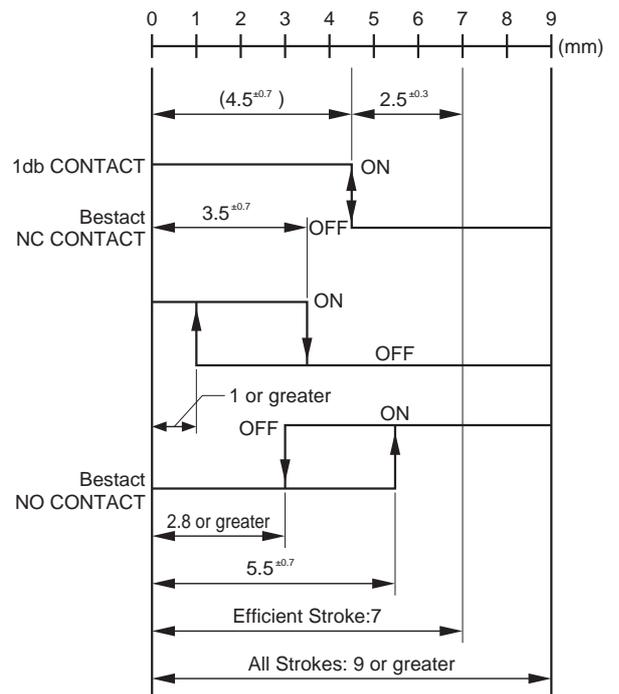
Note: Operate the plunger within the speed that the plunger can follow.
(Do not release the plunger rapidly.)

• Example of representative

Type PPMU-G
(Operation of NO contact and NC contact)



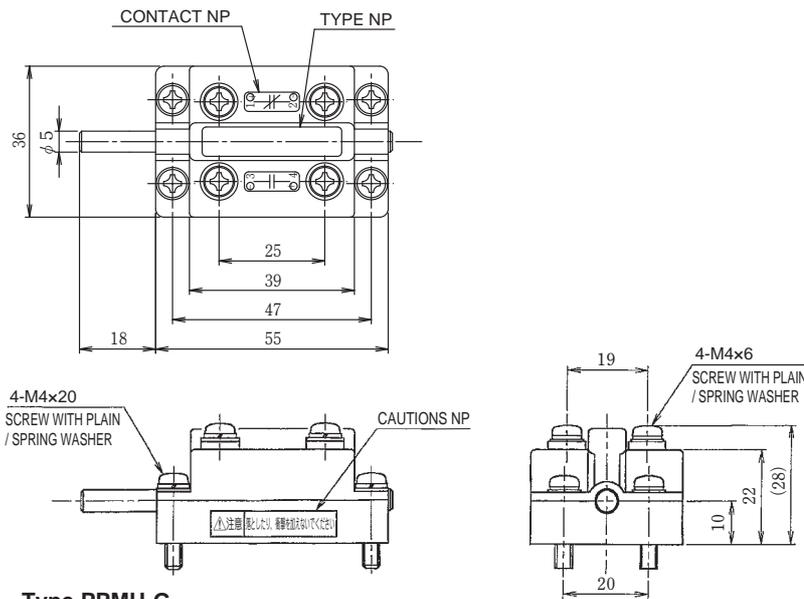
Type PPMU-E



Note: Operate the plunger within the speed that the plunger can follow.
(Do not release the plunger rapidly.)

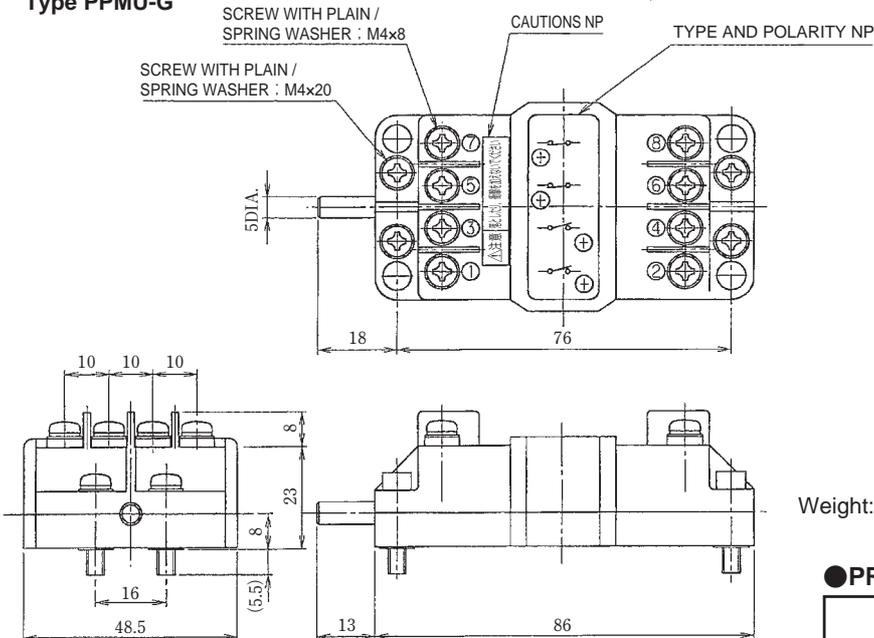
DIMENSIONS in mm

Type PSPD-07G



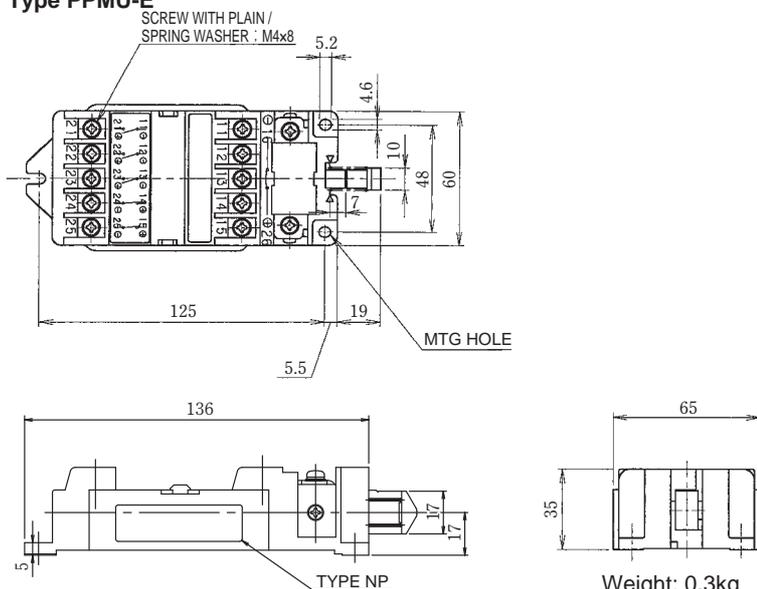
Weight: 0.1kg

Type PPMU-G



Weight: 0.2kg

Type PPMU-E



Weight: 0.3kg

● PRECAUTIONS FOR MOUNTING

⚠ CAUTION

- Switch mounting screw torque must be $0.98\text{N}\cdot\text{m}$ ($10\text{kgf}\cdot\text{cm}$) $\pm 10\%$. (Do not tighten screws too firmly to prevent them from damaging.)

⊘ RESTRICTION

- This switch cannot be used where dust and cutting powder are present. (They might come into a gear in the switch and lock it.)

● PRECAUTIONS FOR WIRING

⚠ CAUTION

- When the switch is used in a DC circuit, connect cables to \oplus / \ominus according to the direction on NP. (Failure to follow this instruction may result in cut-down of contact life.)
- Connecting wire must be 2mm^2 or less.
- Terminal screw torque must be $0.88\text{N}\cdot\text{m}$ ($9\text{kgf}\cdot\text{cm}$) $\pm 10\%$. (Do not tighten screws too firmly to prevent them from damaging.)

HEAVY DUTY LIMIT SWITCHES

Spring Return Type PSKU-□R25C□
(Medium-Capacity type)

Maintained Type PIKU-□R25C□
(Medium-Capacity type)

High Reliability Superior to That of Non-Contact Type by Employing Double and Triple Barriers. Best Suited for Heavy Duty Application due to Outstanding Environmental Immunity.

FEATURES

1. Complete floodtight and gas resistance:

Outstanding environmental immunity is assured by employing floodtight, corrosion-resistant construction and hermetically sealed contacts.

2. Long-term maintenance free:

The combination of the actuator with high mechanical strength and Bestact switch with high electrical reliability provides long-term maintenance-free operation.

3. Powerful contact:

Directly controls inductive load of 115VDC 0.3A without using any amplifying relay or protective circuit.

4. No contact chattering:

The switches are not ill-affected by operational shock or vibration by employing large actuator movement and enable simple electrical circuit design.



TYPICAL APPLICATIONS

Steel plant equipment, Large type transportation machinery, Material handling equipment and Cement producing equipment.

RATINGS AND SPECIFICATIONS

Type of Actuation	Roller Lever	Cylindrical Roller Lever (Horizontal Mounting)	Cylindrical Roller Lever (Vertical Mounting)	Pull Lever	Pull Lever (Crane Drum Over-Winding Protection)	Fork Lever	Pull Lever (One Direction Pull)
Type*1	PSKU-□R25C	PSKU-□R25CB	PSKU-□R25CV	PSKU-□R25CE	PSKU-□R25CO	PIKU-□R25C	PIKU-□R25CE
Switch Action	Spring return					Maintained	
Incorporated Bestact	R25						
Contact Arrangement Available	2NO 1NO1NC 2NC	2NO, 1NO1NC, 2NC				2NO ^{*4} 1NO1NC	2NO, 1NO1NC, 2NC
Common Specifications	<ul style="list-style-type: none"> Enclosure: Almost equivalent to IP56*7 Rated Insulation Voltage: 250VAC (Power Frequency) Vibration Resistance: 9.8m/s² {1G} (10 to 100Hz) Shock Resistance (Erroneous Operation): 59m/s² {6G} Shock Resistance (Breakdown): 980m/s² {100G} Insulation Resistance: 5MΩ or greater (with 500VDC Megger) Withstand Voltage (Power Frequency) 1500VAC for 1 minute (Across Open Contacts: 500VAC) 					<ul style="list-style-type: none"> Operating Temperature: -10 to +80°C (With no freezing or condensation) Storage Temperature: -20 to +80°C (With no freezing or condensation) Maximum recommended speed of actuation: 100m/min*5·6 Operating Frequency: 1200 times/hour Mechanical Life: 5,000,000 operations or greater Lead-in method: G 1/2 (13 diameter hole) <p>Refer to page 19 for Contact performance.</p>	

Note: * 1. Types with □ such as PSKU-□R25C can vary depending on the contact arrangement.

2NO: □20□ 2NC: □02□ 1NO1NC: □11□

2. Do not change of NO contact to NC contact.

3. For DC circuit, connect odd-numbered terminals to ⊕ and even-numbered terminals to ⊖ .

* 4. When contact arrangement is 2NO, specify the operating direction. If it should turn on in clockwise operation, specify "R" in the square, in counter clockwise operation, specify "L".

* 5. Type PSKU- *R25CO for crane drum over-winding protection doesn't have speed restriction. However, after the contact is turned off, effective measures should be taken to prevent the effect of accidental turning on due to shock or vibration.

* 6. As for type PIKU- *R25C□, minimum operating speed can vary depending on operating conditions. For more information, contact Yaskawa.

* 7. Refer to page 92 for degrees of protection. These switches provide IP56 when they are wired, piped and mounted correctly. They cannot provide IP56 if they are not wired, piped and mounted correctly.

1. Notes for Use

⊘ RESTRICTION

- (1) Do not use these products in places where condensation, corrosive gas and flammable gas are present.
(Failure to follow this instruction may result in electric shock, fire and explosion.)
- (2) Do not modify/ rebuild products.
(Failure to follow this instruction may result in breakdown, fire and electric shock.)
- (3) Do not add excessive force to levers.
(Failure to follow this instruction may result in breakdown and damage.)
- (4) Do not exceed the range of ratings and specifications for these products.
(Failure to follow this instruction may result in fire, breakdown and electric shock.)

2. Notes for Installation

⊘ RESTRICTION

Products achieve IP56 when they are wired and piped correctly.

They cannot achieve IP56 if they are not wired and piped correctly.

Don't leave them in a place where they are exposed to ambient air, water and dust when they are only mounted and are not wired nor piped.

(Failure to follow this instruction may result in corrosion flood, breakdown and performance degradation.)

If they are mounted temporarily without wiring, make sure to give them waterproof and dustproof treatment such as waterproofing for the lead entrance and covering them with waterproof seats.

⚠ CAUTION

- (1) Mount the products at flat and strong locations. Make sure to tighten mounting screws securely not to drop the products.
(Failure to follow this instruction may result in malfunction.)
- (2) Do not hold moving parts such as levers when the products are carried.
(Failure to follow this instruction may result in damage and breakdown.)
- (3) Do not mount them so that the lead entrance aims above horizontal. Read "Note for wiring" carefully before you wire them.
(Failure to follow this instruction may result in malfunction and breakdown due to water.)

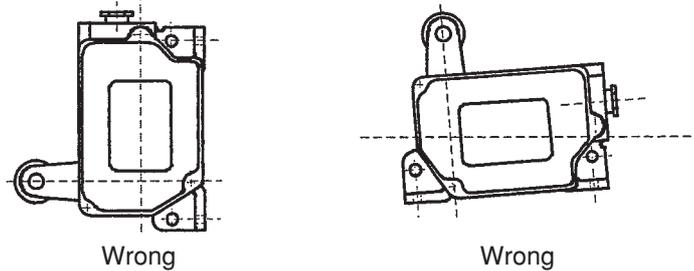


DIAGRAM 1 Mounting Directions

3. Notes for Wiring

⚠ WARNING

Before wiring, make sure that no electricity is supplied to the products.

(Failure to follow this instruction may result in electric shock.)

⚠ CAUTION

- (1) Products achieve IP56 when they are wired and piped correctly.
They cannot achieve IP56 if they are not wired and piped correctly.
Make sure to tighten cover screws (adequate torque: approx. 3.92N·m (40kgf·cm)), cable gland and wire way after wiring and piping.
(Failure to follow this instruction may result in product malfunction due to water and dust.)
- (2) Make sure that wires don't touch moving parts.
(Failure to follow this instruction may result in damaging wires.)
- (3) Where they are used in a DC circuit, connect odd-numbered terminals to ⊕ and even-numbered terminals to ⊖.
(Failure to follow this instruction may result in malfunction, performance decrement, breakdown and fire.)
- (4) Do not leave wire waste and screws in the products.
(Failure to follow this instruction may result in malfunction, performance decrement, breakdown and fire.)

4. Notes for storage

⊘ RESTRICTION

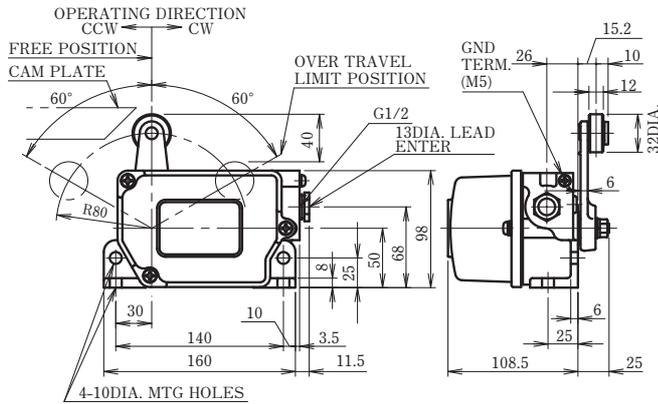
Products achieve IP56 when they are wired and piped correctly.

They cannot achieve IP56 when they are stored. Do not store them in places where they are exposed to harmful gases/liquids, rain or ambient air.

(Failure to follow this instruction may result in corrosion, flood, breakdown and performance decrement.)

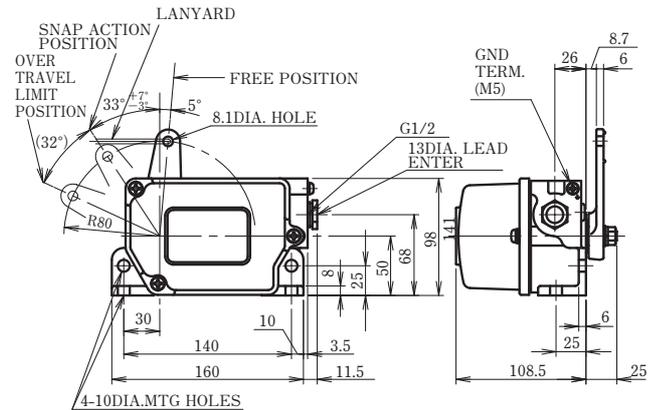
DIMENSIONS in mm

• Roller Lever Type PSKU- \square R25C (Spring return)



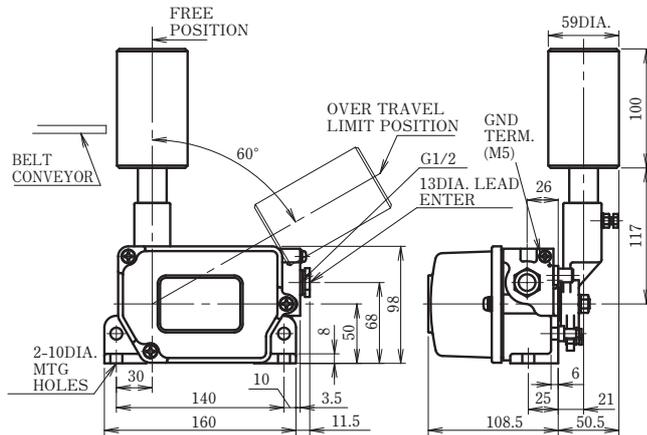
APPROX. WEIGHT: 2kg

• Pull Lever Type PSKU- \square R25CE (Spring return)



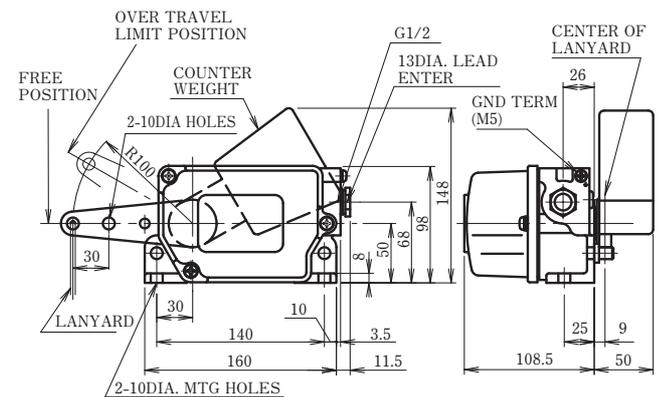
APPROX. WEIGHT: 2kg

• Cylindrical Roller Lever (Horizontal mounting) Type PSKU- \square R25CB (Spring return)



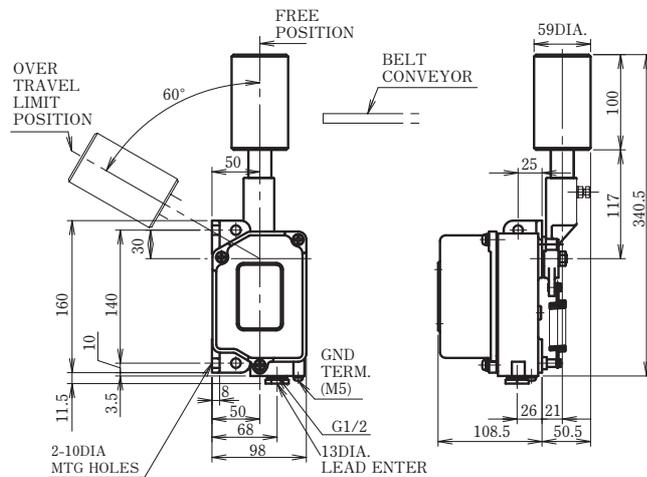
APPROX. WEIGHT: 4kg

• Pull Lever (Crane drum over-winding protection) Type PSKU- \square R25CO (Spring return)



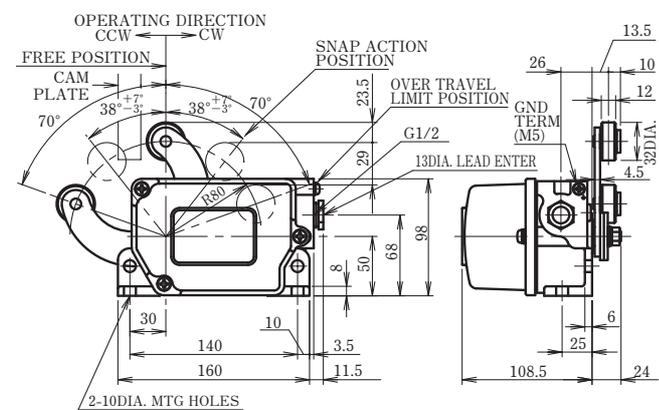
APPROX. WEIGHT: 5kg

• Cylindrical Roller Lever (Vertical mounting) Type PSKU- \square R25CV (Spring return)



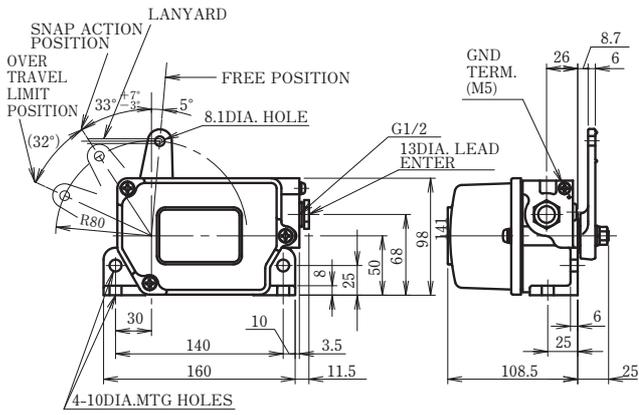
APPROX. WEIGHT: 4kg

• Roller Fork Lever Type PIKU- \square R25C (Maintained)



APPROX. WEIGHT: 2kg

• Pull Level (One direction pull)
Type PIKU-R25CE (Maintained)



APPROX. WEIGHT: 2kg

● DEGREES OF PROTECTION

■ IEC (International Electrotechnical Commission) Standard: IEC60529

IP - □ □

International Protection

Protection that the enclosure provides against access to hazardous parts and the ingress of solid foreign objects

Degree	Definition
4	<p>Wires or screws of thickness greater than 1.0mm. Solid objects exceeding 1.0mm in diameter.</p>
5	<p>Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment.</p>
6	<p>No ingress of dust</p>

Protection of the equipment inside the enclosure against harmful ingress of water

Degree	Definition
0	<p>Non-protected</p> <p>No special protection</p>
2	<p>Vertically dripping water shall have no harmful effect when the enclosure is tilted at any angle up to 15° from its normal position.</p>
3	<p>Water falling as a spray at an angle up to 60° from the vertical shall have no harmful effect.</p>
6	<p>Water projected in powerful jets against the enclosure from any direction shall have no harmful effects.</p>
7	<p>Ingress of water in a harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time.</p>
8	<p>The equipment is suitable for continuous immersion in water under conditions which shall be specified by the manufacturer. Normally, this will mean that the equipment is hermetically sealed. However, with certain types of equipment, it can mean that water can enter but only in such a manner that it produces no harmful effects.</p>

SELECTOR SWITCHES

INCORPORATED SELECTOR SWITCHES Type PLRC-G
 RAINPROOF SELECTOR SWITCHES Type PLWG-G

INCORPORATED SELECTOR SWITCHES

Type PLRC-G

Drastically reduces contact failure and contact bounce in low-voltage applications by employing “The Highly Reliable Power Reed Switch Bestact” .

Two product series available with maximum 16 contacts output (8 steps) and notch angle of 90° (2 notches) or 45° (3 notches). Best for an adverse environment and infrequent use applications for the control/operation of devices for general industry and rolling stocks.

FEATURES

- 1. Applicable for an adverse environment.**
 - Suitable for use under an adverse environment with dust, stain, vibration, and shock.
- 2. High mechanical robustness**
 - Incorporated element is contact-less type that uses a driving magnet where the camshaft penetrates through both ends.
- 3. Well suited for infrequent use applications**
 - Can input directly to the sequencer input circuit. (Applicable to 5VDC and photo coupler inputs.)

APPEARANCE



STANDARD SPECIFICATIONS

Switch Action	Type	Combination of Contact, steps and notches				Notch Interval	Contact Operation Pattern																														
		2 notch type		3 notch type																																	
		Contact Unit Steps	Output Contact	Contact Unit Steps	Output Contact																																
Maintained	PLRC-G2	Max 8 steps Available	Max 16	—	—	2 notch (Notch Angle: 90°) 	<input type="checkbox"/> shows operating stage. <table border="1"> <thead> <tr> <th></th> <th>A Notch</th> <th>C Notch</th> <th></th> </tr> </thead> <tbody> <tr> <td>Pattern 1</td> <td></td> <td></td> <td>Output 2 Contacts</td> </tr> <tr> <td>Pattern 3</td> <td></td> <td></td> <td>Output 2 Contacts</td> </tr> <tr> <td>Pattern 4</td> <td></td> <td></td> <td>Output 1 Contacts Each</td> </tr> <tr> <td>Pattern 5</td> <td></td> <td></td> <td>Output 1 Contacts Each</td> </tr> </tbody> </table>		A Notch	C Notch		Pattern 1			Output 2 Contacts	Pattern 3			Output 2 Contacts	Pattern 4			Output 1 Contacts Each	Pattern 5			Output 1 Contacts Each										
		A Notch	C Notch																																		
Pattern 1			Output 2 Contacts																																		
Pattern 3			Output 2 Contacts																																		
Pattern 4			Output 1 Contacts Each																																		
Pattern 5			Output 1 Contacts Each																																		
	PLRC-G3	—	—	Max 8 steps Available	Max 16	3 notch (Notch Angle: 45°) 	<table border="1"> <thead> <tr> <th></th> <th>A Notch</th> <th>B Notch</th> <th>C Notch</th> <th></th> </tr> </thead> <tbody> <tr> <td>Pattern 1</td> <td></td> <td></td> <td></td> <td>Output 2 Contacts</td> </tr> <tr> <td>Pattern 2</td> <td></td> <td></td> <td></td> <td>Output 2 Contacts</td> </tr> <tr> <td>Pattern 3</td> <td></td> <td></td> <td></td> <td>Output 2 Contacts</td> </tr> <tr> <td>Pattern 4</td> <td></td> <td></td> <td></td> <td>Output 1 Contacts Each</td> </tr> <tr> <td>Pattern 5</td> <td></td> <td></td> <td></td> <td>Output 1 Contacts Each</td> </tr> </tbody> </table>		A Notch	B Notch	C Notch		Pattern 1				Output 2 Contacts	Pattern 2				Output 2 Contacts	Pattern 3				Output 2 Contacts	Pattern 4				Output 1 Contacts Each	Pattern 5				Output 1 Contacts Each
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Pattern 4				Output 1 Contacts Each																																	
Pattern 5				Output 1 Contacts Each																																	

Note: * 1. When using 3 notches type, contact overlap might occur while the notches are being switched depending on a contact arrangement.
 * 2. Select contact operation pattern from the above. Other than the above is not available.

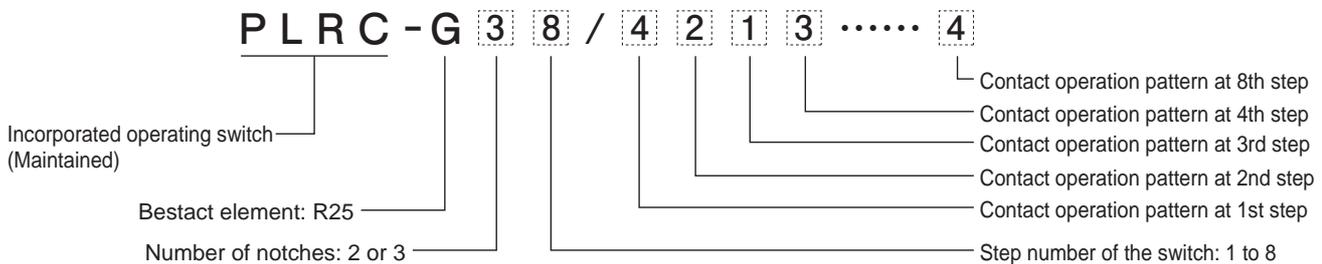
CONTACT RATINGS AND SPECIFICATIONS

Product Type		PLRC-G □□/□□□□□□□□
Contact Arrangement		Min. 1 step (2 contacts), Max. 8 steps (16 contacts)*
Incorporated Bestact		R25
Rated Insulation Voltage		250VAC (Power Frequency)
Contact Performance		Refer to page 19.
Enclosure		Almost equivalent to IP40
Insulation Characteristics	Insulation Resistance	100MΩ or greater (with 500VDC Megger)
	Withstand Voltage (Power Frequency)	Across Open Contacts: 500VAC for 1 minute
		Across Reed Switches: 1500VAC for 1 minute
Mechanical Life		500,000 operations or greater
Ambient Temperature (With no freezing or condensation)	Operating	-20 to +60°C
	Storage	-30 to +70°C
Vibration Resistance		9.8m/s ² {1G} (10 to 55Hz)
Shock Resistance	Erroneous Operation	98m/s ² {10G}
	Breakdown	980m/s ² {100G}
Connecting Method		Electrical Cable or Amp Terminal (Recommended Amp: 4-1.25SQ)

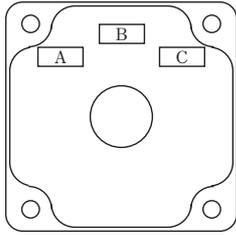
Note: * The even-numbered step is a standard type. A dummy step unit is mounted for the odd-numbered step to make it even-numbered step before shipment.

TYPE DESIGNATION

* Please refer to the previous page for contact operation pattern.



NAME PLATES

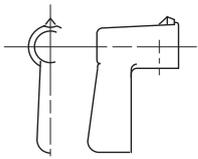


Material: Brass

Position	A	B	C
2 Notches	OFF	—	ON
3 Notches	1	2	3

* Name plates other than tabulated above are available by order made.

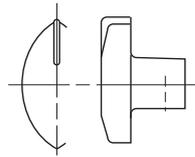
SELECTOR HANDLES * All types except for pistol type will be order made.



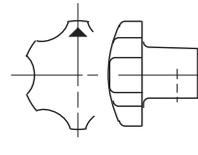
Pistol Type



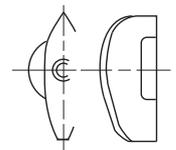
Pistol Type (Big Size)



Egg Shaped Type

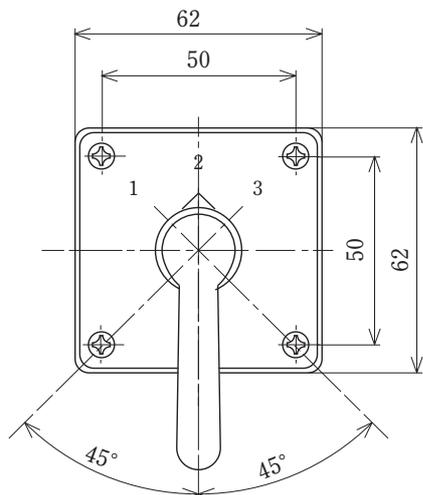
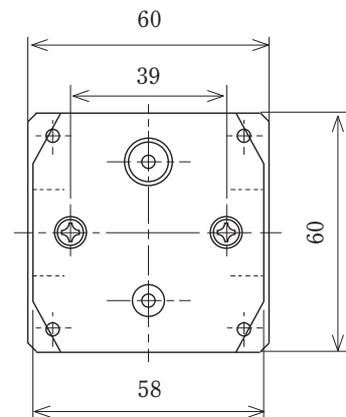
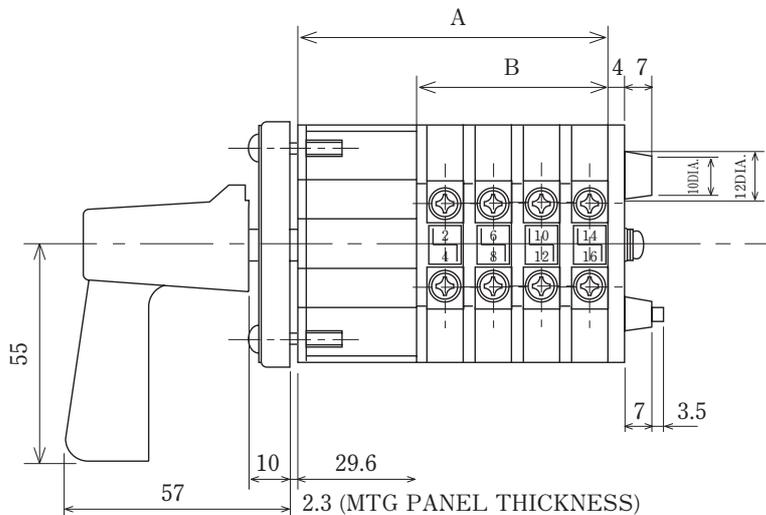


Flower Shaped Type



Knob Type

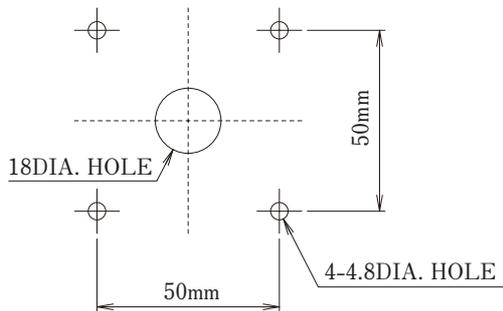
DIMENSIONS in mm



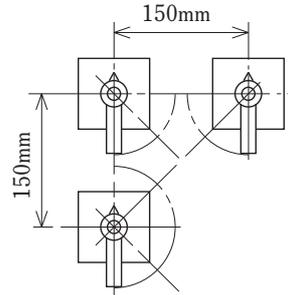
Type	A	B	Weight (g)
PLRC-G 1	53.6	24	280
PLRC-G 2	53.6	24	330
PLRC-G 3	77.6	48	425
PLRC-G 4	77.6	48	480
PLRC-G 5	101.6	72	575
PLRC-G 6	101.6	72	630
PLRC-G 7	125.6	96	725
PLRC-G 8	125.6	96	780

MOUNTING

• Drilling Plan for Mounting Hole



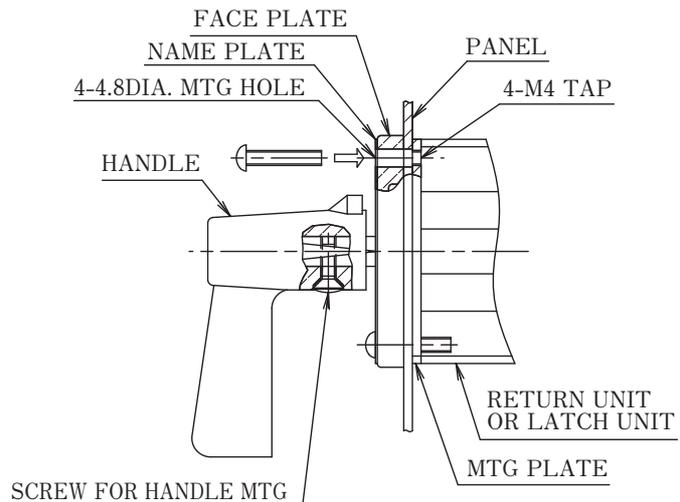
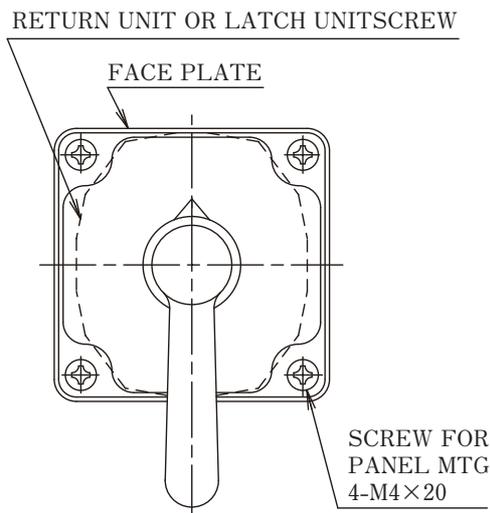
• Recommended Mounting Pitch



• Mounting method

This switch should be mounted from the back side of the mounting panels such as the control tables and switch boards. Then a base is inserted (It has returning mechanism and a contact unit), and the face plates are combined from the face side. (Refer to the figure below).

It is tightened from the face plate side with a round small screw of M4 by using the M4 tap of the mounting base.



● PRECAUTIONS FOR MOUNTING

⚠ CAUTION

- Make sure to hold a lever in a control part and turn it. (Do not hit it strong to prevent it from damaging.)

⊘ RESTRICTION

- This switch cannot be used where dust and cutting powder are present. (They might come into a gear in the switch and lock it.)

● PRECAUTIONS FOR MOUNTING

⚠ CAUTION

- When used in a DC circuit, connect ⊕ with the line of terminal number 1 (1, 5, 9, 13, 17, 21, 25, 29) and the line of terminal number 4 (4, 8, 12, 16, 20, 24, 28, 32) according to the step number of the switch unit.
- Connecting wire must be 2mm² or less.
- Terminal screw torque must be 0.88N·m (9kgf·cm) ±10%. (Do not tighten screws too firmly to prevent them from damaging.)

RAINPROOF SELECTOR SWITCHES Type PLWG-G

FEATURES

- Provides high reliability in an adverse environment by incorporating the hermetically sealed glass contact.
- Enables long-term maintenance-free operations.

TYPICAL APPLICATIONS

- Selector switches in an adverse environment such as in steel plants and cement making equipment.



RATINGS AND SPECIFICATIONS

Product Name		RAINPROOF SELECTOR SWITCHES																									
Type		PLWG-G																									
Contact Arrangement		4 steps (4 contacts)																									
Incorporated Bestact		R25																									
Rated Insulation Voltage		250VAC (Power Frequency)																									
Contact Performance		Refer to page 19.																									
Vibration Resistance		9.8m/s ² {1G} (10 to 55Hz)																									
Shock Resistance	Erroneous Operation	98m/s ² {10G}																									
	Breakdown	980m/s ² {100G}																									
Insulation Characteristics	Insulation Resistance	5MΩ or greater (with 500VDC Megger)																									
	Withstand Voltage (Power Frequency)	1500VAC for 1 minute (Across Open Contacts: 500VAC)																									
Mechanical Life		3,000,000 operations or greater																									
Enclosure		Almost equivalent to IP56																									
Ambient Temperature (With no freezing or condensation)	Operating	-10 to +80°C																									
	Storage	-20 to +80°C																									
Contact Operation		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Notch Interval</th> <th colspan="3">Contact operation pattern (is the range where contacts are ON.)</th> </tr> <tr> <th style="text-align: center;"> (Notch Angle: 45°) </th> <th style="width: 15%;">Notch</th> <th style="width: 15%;">A Notch</th> <th style="width: 15%;">B Notch</th> <th style="width: 15%;">C Notch</th> </tr> </thead> <tbody> <tr> <td>Pattern 1</td> <td style="text-align: center;"></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pattern 2</td> <td style="text-align: center;"></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pattern 3</td> <td style="text-align: center;"></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Notch Interval	Contact operation pattern (is the range where contacts are ON.)			 (Notch Angle: 45°)	Notch	A Notch	B Notch	C Notch	Pattern 1					Pattern 2					Pattern 3				
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		 (Notch Angle: 45°)	Notch	A Notch	B Notch	C Notch																					
		Pattern 1																									
Pattern 2																											
Pattern 3																											
Any contact arrangement other than shown above is not available.																											

Note: * 1. When using 3 notch type, contact overlap might occur while the notches are being switched depending on a contact operation pattern.
 * 2. These switches provide IP56 when they are wired, piped and mounted correctly. They cannot provide IP56 if they are not wired, piped and mounted correctly.

TYPE DESIGNATION

PLWG-GSP34/1212

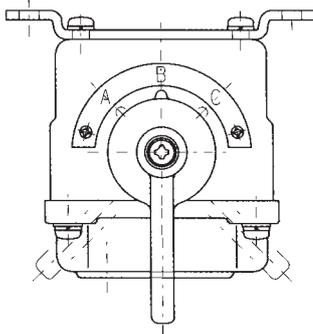
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Symbol description

- ① Mechanical switch
- ② L: Maintained
O: Automatic return
- ③ Selector switch for indoor/outdoor
- ④ Bestact element: Type R25
- ⑤ Mounting pitch S: 92mm
Y: 100mm
- ⑥ External stop mechanism P: With stop mechanism (handle removable)
B: With stop mechanism (handle not removable)
K: Without stop mechanism (handle removable)
Blank: Without stop mechanism (handle not removable)
- ⑦ Notch number 3: 3 Notches
- ⑧ Contact number 4: 4 contacts
- ⑨ Contact operation pattern at 1st step
- ⑩ Contact operation pattern at 2nd step
- ⑪ Contact operation pattern at 3rd step
- ⑫ Contact operation pattern at 4th step (Select contact operation pattern from table 1.)

Note: * 1. Symbols of ① to ⑥ are indicated on the products. However, contact operation patterns of ⑨ to ⑫ are not indicated.

NAME PLATE LETTER



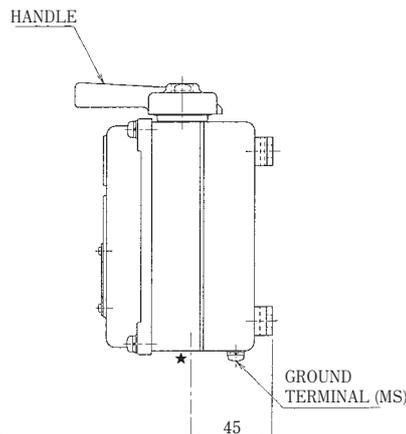
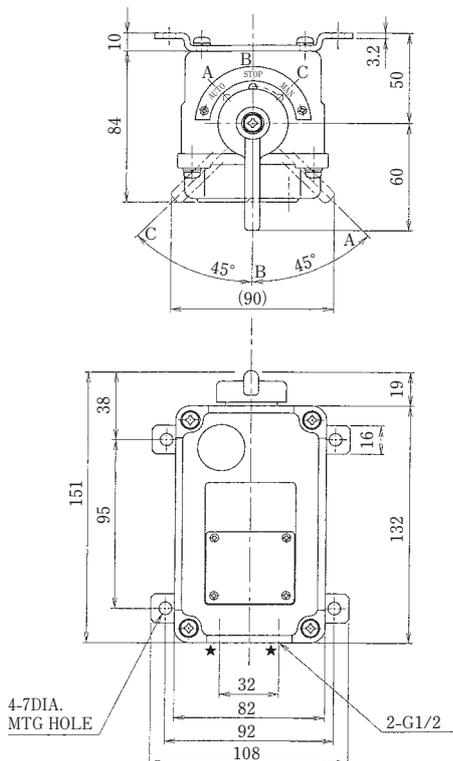
NAME PLATE LETTER

LETTER POSITION	A	B	C
3 NOTCH	AUTO	STOP	MAN

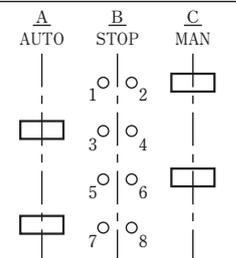
Note: Other letters are available. Please contact Yaskawa.

DIMENSIONS in mm

PLWG-GS34

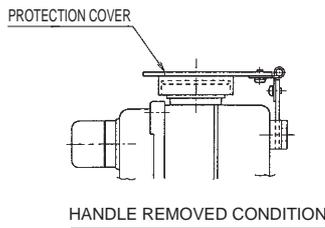
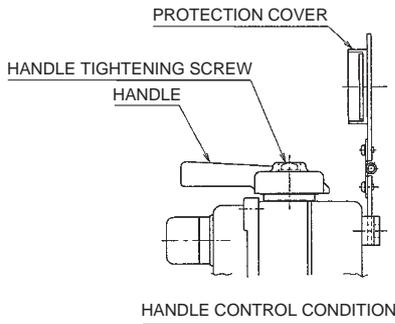
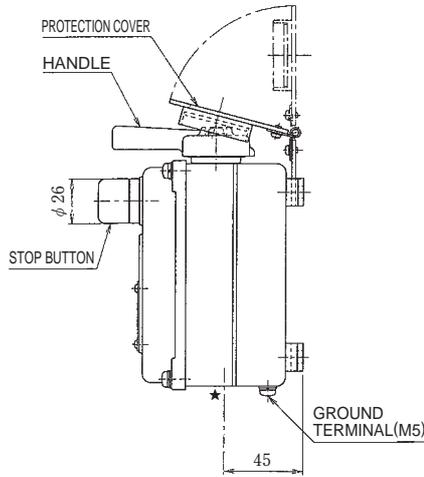
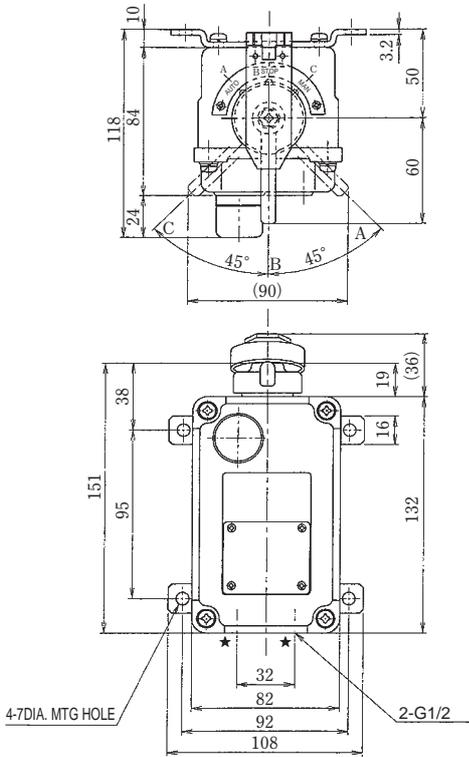


CONTACT ARRANGEMENT

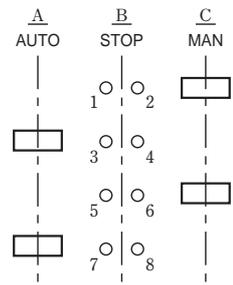


- Note: 1. when the switch is used in a DC circuit, connect odd number to ⊕, and even number to ⊖.
- 2. The part indicated with ★ is lead enter which is processed into G1/2.

• PLWG-GSP34

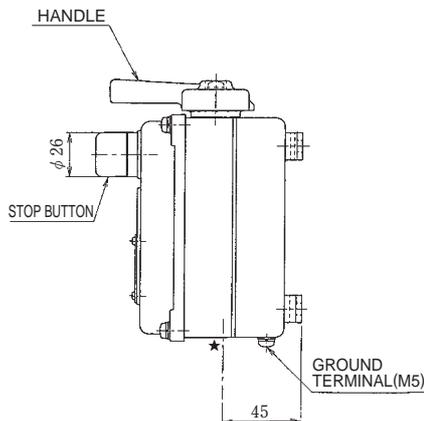
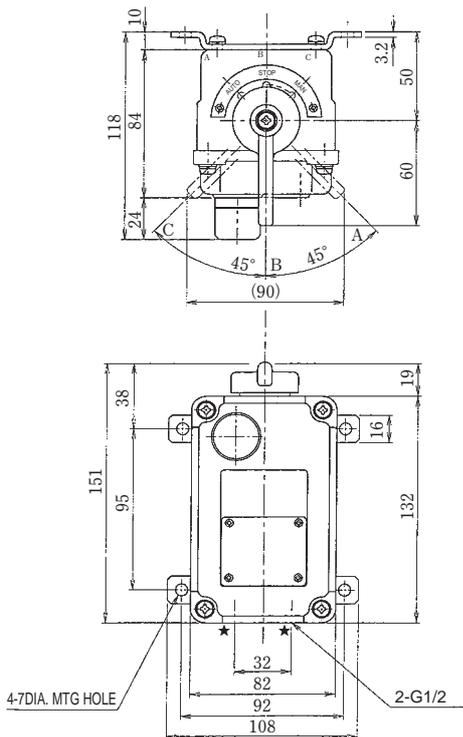


CONTACT ARRANGEMENT

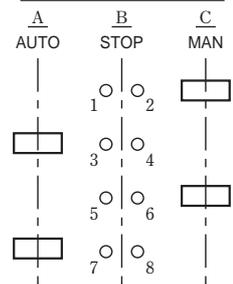


- Note: 1. Control the handle with the protection cover opened up.
The protection cover automatically returns to the initial position by a spring power when it is released.
2. The handle is removable by loosening screws.
(Shaft parts are protected by protection covers.)
3. When the handle is removed by operating to direction A, the inner mechanism can be returned to position B by pushing the stop button.
(When the handle is operated to direction C, it cannot be returned by the button.)
4. When the switch is used in a DC circuit, connect odd number to ⊕, and even number to ⊖.
5. The part indicated with ★ is lead enter which is processed into G1/2.

• PLWG-GSB34

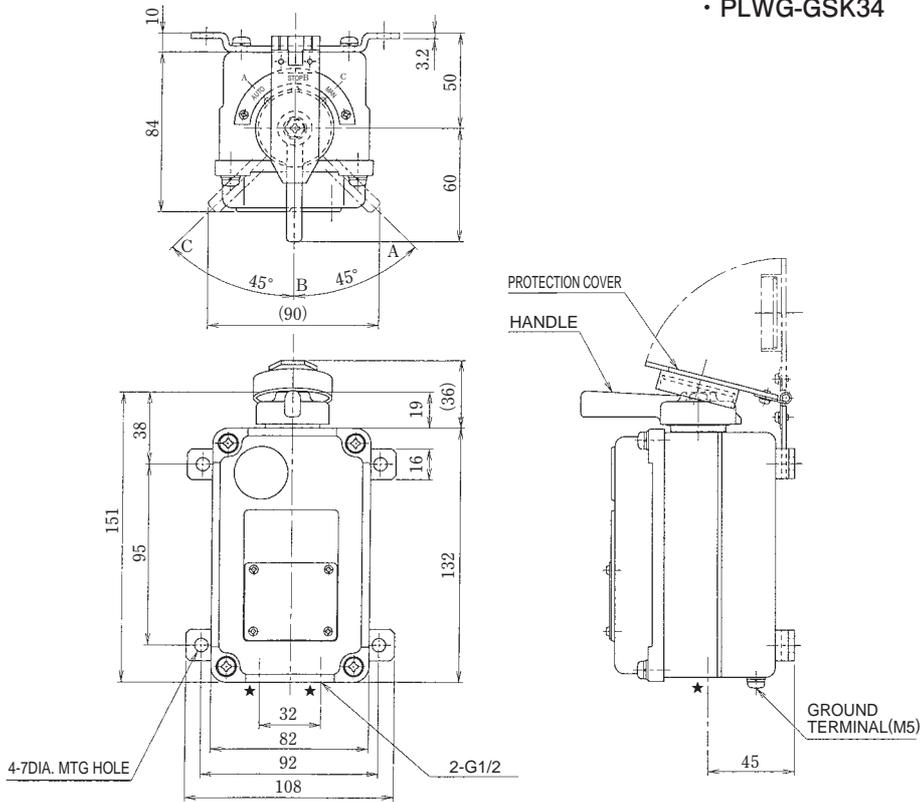


CONTACT ARRANGEMENT

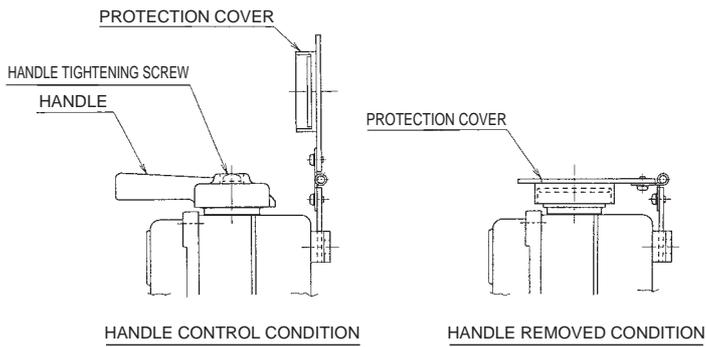
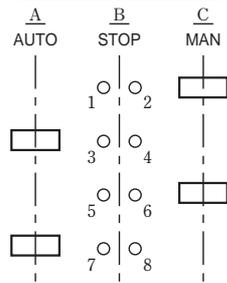


- Note: 1. When the handle is removed by operating to direction A, the inner mechanism can be returned to position B by pushing the stop button.
(When the handle is operated to direction C, it cannot be returned by the button.)
2. When the switch is used in a DC circuit, connect odd number to ⊕, and even number to ⊖.
3. The part indicated with ★ is lead enter which is processed into G1/2.

• PLWG-GSK34



CONTACT ARRANGEMENT



- Note: 1. Control the handle with the protection cover opened up.
The protection cover automatically returns to the initial position by a spring power when it is released.
2. The handle is removable by loosening screws.
(Shaft parts are protected by protection covers.)
3. When the switch is used in a DC circuit, connect odd number to ⊕, and even number to ⊖.
4. The part indicated with ★ is lead enter which is processed into G1/2.

International Standards

Product	Type	UL Standards	cUL Standards	CE Marking (Low Voltage Directive, RoHS Directive)
		 	 	
Bestact Reed Switch	R25 (R25U)	○	○	○
	R15 (R15U)	○	○	○
Relay	RI-B,C	○	○	○
	RI-D,E	○	○	○
	RZDR-E	—	—	○
	RZDR-G	—	—	○
	RB-3P	—	—	○
	RB3P-G	—	—	○
	RB4P-G	—	—	○
	RB6P-G	—	—	○
	RB-5ABEC	—	—	○
	RIW	—	—	○
Magnetic Proximity Switch	PSMS-R	—	—	○
	PSMS-M	—	—	○
	PSMM-R	○	○	○
	PSMM-M	○	○	○
	PSMO	—	—	○
	PSMS-RV	—	—	○
	PSMS-MV	—	—	○
	PPUU	—	—	—
	PSPD	—	—	—
Limit Switch	PSKU, PIKU	—	—	○

〈COMMON PRECAUTIONS FOR USE〉

1 Handling CAUTION

Bestact is a hermetically sealed glass contact. Note the following when handling Bestact products.

(1) Do not hit the products, do not strike them against any instruments and do not drop them.

If the glass is cracked, they will not operate or their performance will decrease drastically.

(2) Do not apply excessive force to the terminals and cables.

2 Application to direct current loads CAUTION

When the products are applied to DC loads, connect the contacts according to the specified polarity.

Electrical life might decrease drastically if the contacts are connected with the wrong polarity.

3 Contact switching ratings RESTRICTION

(1) When a current exceeding the maximum making current is applied, the contact might weld or the glass might crack.

(2) When a current exceeding the maximum breaking current is applied, the contact might weld or fuse and the glass might crack.

Do not apply voltage nor current exceeding the contact switching ratings to the contacts.

4 External magnetic field CAUTION

Do not use the products where there is external magnetic field of 1mT (10Gauss) or greater.

This might cause contact malfunction.

5 Mounting RESTRICTION

(1) When mounting magnetic proximity switches with lead entrances, do not mount them with the lead entrance pointing up.

Insulation characteristics might deteriorate if rain water enters the switches.

(2) When wiring magnetic proximity switches, do not change connecting cables.

Do not pull cables strongly.

6 Storage

RESTRICTION

Do not store the products in a place where they are exposed to rain water, high temperature / humidity, drastic temperature change, harmful gases / liquids or direct sunlight.

Warranty

◆ Details of Warranty

■ Warranty Period

The warranty period for a product that was purchased (hereinafter called "delivered product") is one year from the time of delivery to the location specified by the customer or 18 months from the time of shipment from the Yaskawa factory, whichever is sooner.

■ Warranty Scope

Yaskawa shall replace or repair a defective product free of charge if a defect attributable to Yaskawa occurs during the above warranty period. This warranty does not cover defects caused by the delivered product reaching the end of its service life and replacement of parts that require replacement or that have a limited service life.

This warranty does not cover failures that result from any of the following causes.

- Improper handling, abuse, or use in unsuitable conditions or in environments not described in product catalogs or manuals, or in any separately agreed-upon specifications
- Causes not attributable to the delivered product itself
- Modifications or repairs not performed by Yaskawa
- Use of the delivered product in a manner in which it was not originally intended
- Causes that were not foreseeable with the scientific and technological understanding at the time of shipment from Yaskawa
- Events for which Yaskawa is not responsible, such as natural or human-made disasters

◆ Limitations of Liability

- Yaskawa shall in no event be responsible for any damage or loss of opportunity to the customer that arises due to failure of the delivered product.
- Yaskawa shall not be responsible for any programs (including parameter settings) or the results of program execution of the programs provided by the user or by a third party for use with programmable Yaskawa products.
- The information described in product catalogs or manuals is provided for the purpose of the customer purchasing the appropriate product for the intended application. The use thereof does not guarantee that there are no infringements of intellectual property rights or other proprietary rights of Yaskawa or third parties, nor does it constitute a license.
- Yaskawa shall not be responsible for any damage arising from infringements of intellectual property rights or other proprietary rights of third parties as a result of using the information described in catalogs or manuals.

◆ Suitability for Use

- It is the customer's responsibility to confirm conformity with any standards, codes, or regulations that apply if the Yaskawa product is used in combination with any other products.
- The customer must confirm that the Yaskawa product is suitable for the systems, machines, and equipment used by the customer.
- Consult with Yaskawa to determine whether use in the following applications is acceptable. If use in the application is acceptable, use the product with extra allowance in ratings and specifications, and provide safety measures to minimize hazards in the event of failure.
- Outdoor use, use involving potential chemical contamination or electrical interference, or use in conditions or environments not described in product catalogs or manuals
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, vehicle systems, medical equipment, amusement machines, and installations subject to separate industry or government regulations
- Systems, machines, and equipment that may present a risk to life or property
- Systems that require a high degree of reliability, such as systems that supply gas, water, or electricity, or systems that operate continuously 24 hours a day
- Other systems that require a similar high degree of safety
- Never use the product for an application involving serious risk to life or property without first ensuring that the system is designed to secure the required level of safety with risk warnings and redundancy, and that the Yaskawa product is properly rated and installed.
- The circuit examples and other application examples described in product catalogs and manuals are for reference. Check the functionality and safety of the actual devices and equipment to be used before using the product.
- Read and understand all use prohibitions and precautions, and operate the Yaskawa product correctly to prevent accidental harm to third parties.

◆ Specifications Change

The names, specifications, appearance, and accessories of products in product catalogs and manuals may be changed at any time based on improvements and other reasons. The next editions of the revised catalogs or manuals will be published with updated code numbers. Consult with your Yaskawa representative to confirm the actual specifications before purchasing a product.

Bestact

YASKAWA POWER REED SWITCH

SAFETY

PRECAUTION

- Before initial operation, read through the product's instruction manual and other attached documents thoroughly and use the product properly.
- Although the product is produced under strict quality control, you must apply a safety device if the product is applied to a machine for which malfunction can risk human life or may seriously damage facility.
- Wiring must be done by an expert of electrical wiring.
- Do not modify the product under any circumstances.

In this instruction, The NOTES FOR SAFE OPERATION are classified as "WARNING", "CAUTION" "RESTRICTION" or "REQUIREMENT"



: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious personal injury.



: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate personal injury and/or damage to the equipment.
In some instances, items described in  CAUTION may also result in a serious accident. In either case, follow these important items.



: Indicates an action which must not be taken.



: Indicates customer action is required.

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Homepage URL
<https://bestact.co.jp>

Contact Us (Bestact & Control Equipment Division)
cbes@yaskawa.co.jp

YASKAWA

BESTACT SOLUTIONS INC.

- In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply.
- Specifications are subject to change without notice for ongoing product modifications and improvements.

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